

PRINCE WILLIAM SOUND MANAGEMENT AREA

1999 ANNUAL FINFISH MANAGEMENT REPORT



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PRINCE WILLIAM SOUND SALMON AND HERRING FISHERIES

Management Area Description

The Prince William Sound (PWS) management area encompasses all coastal waters and inland drainages entering the northcentral Gulf of Alaska between Cape Suckling and Cape Fairfield (Appendix A.1). This area includes the Bering River, Copper River and all of Prince William Sound with a total adjacent land area of approximately 38,000 square miles.

The salmon management area is divided into eleven districts that correspond to the local geography and distribution of the five species of salmon harvested by the commercial fishery. The management objective for all districts is the achievement of escapement goals for the major species while allowing for the orderly harvest of all fish surplus to spawning requirements. In addition, the department follows regulatory plans to manage fisheries and assist private non-profit (PNP) hatcheries in achieving cost recovery and broodstock objectives.

Six hatcheries contribute to the area's fisheries. Five are operated by the regional aquaculture association, Prince William Sound Aquaculture Corporation (PWSAC). The Gulkana Hatchery in Paxson augments the production of sockeye salmon to the Copper River. The Cannery Creek Hatchery located on the north shore of the Sound, and the A.F. Koernig Hatchery in the southwestern Sound produce pink salmon, the Noerenberg Hatchery in the northwestern Sound produces pink, chum, and coho salmon and the Main Bay Hatchery in the western Sound produces sockeye salmon. Valdez Fisheries Development Association (VFDA) operates the Solomon Gulch Hatchery in Port Valdez and produces pink and coho salmon.

Gear for the salmon fishery includes purse seine, drift and set gillnet. Drift gillnet permits are the most numerous and are allowed in the Bering River, Copper River, Coghill, Unakwik and Eshamy Districts. Set gillnet gear is allowed only in the Eshamy District. Purse seine gear is allowed in the Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague and Southeastern Districts.

As an avenue for the commercial fishing industry to formally provide management recommendations to the department, representatives from PWS area processors, gear groups, and aquaculture associations sit on an advisory body known as the PWS Salmon Harvest Task Force (SHTF).

Five herring fisheries occur during the year. The gillnet sac roe, purse seine sac roe, spawn-on-kelp not in pounds, and spawn-on-kelp in pounds fisheries occur in the spring. A herring food/ bait fishery occurs in the fall. All of the herring fisheries are managed for a guideline harvest level established by the Prince William Sound Herring Management Plan, 5 AAC 27.365. The management objective for herring is to target fisheries on a high quality segment of the biomass.

Overview of Area Wide Fisheries

The 1999 Prince William Sound Area commercial salmon harvest of 50.3 million fish is the highest on record (Appendix A.3). The harvest was comprised of 45 million pink, 2 million sockeye, 2.99 million chum, 244.7 thousand coho, and 63.4 thousand chinook salmon (Appendix A.2.). The majority of the catch, 36.4 million, was common property harvest and 13.9 million were sold for hatchery cost recovery (exclusive of roe/meal sales).

The estimated value of the combined commercial salmon harvest is \$50.3 million, including hatchery sales (Appendices A.5 and A.6). During the 1999 season, 523 drift gillnet permit holders fished. The drift gillnet catch is valued at \$27.9 million, setting the average earnings at \$53,280. The set gillnet catch is valued at \$432,317 setting the average earnings of the 21 participating permits at \$20,587. The seine fishery was worth \$13.1 million for an average ex-vessel value of \$93,983 for the 139 permit holders that participated this year (Appendix A.8). Revenue generated for hatchery operations (exclusive of roe/meal sales) was approximately \$8.84 million.

Three of the four spring herring fisheries and the fall food/bait fishery were canceled inseason due to low stock abundance. Nine permit holders in the herring pound fishery harvested an estimated 22,300 pounds of roe on kelp in 1999. No estimated value has been assigned to the harvest.

1999 SEASON SUMMARY BY DISTRICT

Copper River District

Preseason Outlook and Harvest Strategy

The 1999 harvest forecast for the Copper River District was 53,000 chinook, 1.25 million sockeye, and 304,000 coho salmon. The Gulkana Hatchery located north of Paxson Lake was expected to contribute approximately 400,000 sockeye salmon to the commercial catch. The actual 1999 sockeye salmon harvest of 1,682,559 was the third largest on record (Appendix B.1.). The harvest of 62,337 chinook salmon was slightly above the projected harvest and was also the third largest chinook harvest on record, being surpassed by the harvests of 1995 and 1998 (Appendix B.8). The inriver goal past Miles Lake sonar of 750,000 salmon was exceeded with an estimated 851,000 salmon passing the sonar site by August 3 when the sonar was removed. The sockeye salmon aerial escapement index for Copper River Delta systems was 100,945 fish, approximately 13% above the index goal of 89,050.

The traditional fishing schedule for the Copper River District is two 24-hour periods per week. Periods begin at 7:00 a.m. on Mondays and 7:00 p.m. on Thursdays. The duration of fishing periods are adjusted by emergency order as needed to meet escapement goals and provide for an orderly harvest. After August 7, the management priority switches from sockeye salmon to coho salmon management. Due to the recurrent weakness in coho returns in recent years, the 1999 season was anticipated to begin with one 24-hour period per week. Additional fishing time would depend upon the strength of the return determined from harvest and escapement information. Fishing periods during the coho fishery began at 12:00 noon during the 1999 season however; the Board of Fisheries changed the start time back to 7:00 a.m. for subsequent seasons.

Early in the season, management of the Copper River District is based on the actual harvest as compared to the anticipated harvest. This is the most reliable method of evaluating early run strength prior to the installation of the inriver sonar at Miles Lake. In late May, sonar counts and commercial harvest information become the primary factors governing management of the fishery. The 1999 inriver goal for the upper Copper River was 725,000 salmon past the counter by early August. By mid-June, an aerial estimate of sockeye escapement in the Copper River Delta systems becomes an additional consideration when scheduling commercial fishing periods. Due to the many spawning systems in the lower Copper River Delta, an actual weekly escapement index of selected sockeye systems is compared to an anticipated weekly escapement index. The escapement index goal for the Copper River Delta is 89,050 sockeye salmon.

Sockeye and Chinook Fishery, Season Summary

The 1999 commercial fishing season began on May 14 with a 12-hour fishing period (Appendix B.4.). The use of a 12-hour period instead of the traditional 24-hour period was in response to the extremely low water level of the Copper River, and to satisfy the directives of the Chinook Salmon Management Plan (5 AAC 24.361) which called upon the department to reduce the harvest potential of the commercial fishery by 5%. In addition to the reduction in time, the inside waters from the west side of Pete Dahl to the east side of Kokenhenik were closed (Appendix B.7.). The first period's harvest was 24,439 sockeye and 7,659 chinook salmon versus an anticipated harvest of 22,236 sockeye and 6,276 chinook salmon (Appendix B.2.). The sockeye harvest was 9% above the projected while the chinook harvest, even with the time and area restrictions, was 22% above the projected.

The North Gulf Coast and the Copper River delta received significant snowfall during winter of 1998-99 while the interior snowfall was reported to be below average. The water level of the Copper River remained well below the historic average and portions of the river above the 27-Mile bridge remained ice covered when commercial fishing commenced on May 14. Unlike the 1998 season when storms during May hampered the fleet's efficiency, weather conditions for the first four openings of 1999 were favorable. The U.S. Coast Guard had transported the ADF&G crew to the Miles Lake sonar site on May 12 although escapement information was not available from the Miles Lake sonar site until May 23 due to ice conditions at Miles Lake. With the actual harvest being close to the anticipated and few blush fish showing up in the harvest, preliminary indications were that both the sockeye and chinook returns were close to the preseason forecast. A lower than anticipated harvest for either chinook or sockeye would have been interpreted as a weaker than forecast return. The second fishing period was again a 12-hour period and was scheduled for Monday, May 17. Ongoing commercial harvesting would help to further determine the strength of the salmon return prior to the installation of the sonar counter. The harvest for the second 12-hour period was 37,804 sockeye and 8,039 chinook salmon versus a projected harvest of 37,757 sockeye and 6,902 chinook salmon. The difference between the projected and actual sockeye salmon harvests was only 47 fish while the chinook salmon harvest was 1,137 fish above the projected. The area restriction closing inside waters was not in effect during the second period. In contrast, during the record setting sockeye salmon harvest of 1997, the second period's harvest that year was 209,000 sockeye and 11,000 chinook salmon.

The next scheduled announcement was at 2:00 p.m. on Wednesday, May 19. Sonar counts from Miles Lake were not yet available. The cumulative harvest for the first two commercial fishing periods was 62,200 sockeye salmon, which was very close to the projected cumulative harvest of 60,000 fish. For chinook salmon, the cumulative harvest stood at 15,700 fish versus a projected harvest of 13,200. With the actual harvest being very close to the projected harvest, a third fishing period was announced for May 21. In deference to the continuing low water conditions, the fishing period was again reduced to 12-hours. The harvest from the third period was 109,204 sockeye and 8,165 chinook salmon. The projected third period harvest was 61,786 sockeye and 7,839 chinook salmon. Reports from fishers were that a majority of the sockeye harvest was occurring in outside waters. The excellent weather and coordinated efforts to locate sockeye salmon offshore likely lead to the third period's sockeye harvest exceeding the projected by some 47,000 fish. In addition, the low water conditions and the thermal differences between ocean temperatures and the freshwater temperatures may have been causing sockeye salmon to hold in outside waters.

The fourth fishing period, announced on May 22, was again scheduled for 12 hours on Monday, May 24. In response to the continuing low water conditions and the lack of sonar data, the fourth period was again held to 12-hours duration. The Copper River drift gillnet fishery has never begun a season with 4 consecutive 12-hour periods, although single periods have been cancelled in response to low escapement. The harvest from Monday's fishing period was 126,961 sockeye and 6,999 chinook salmon. These numbers compared closely to the projected harvest of 105,077 sockeye and 7,384 chinook salmon. The first day's sonar counts from Miles Lake occurred on May 23 when an estimated 960 salmon passed the counters. The projected count for the day was 2,689. During low water conditions, the sonar transducer is mounted on a portable tripod until the river rises and the transducer can be moved to a rail mounted onto a permanent substrate. The tripod configuration requires increased calibrations by the crew to maintain counting efficiency. River ice and icebergs from Miles Glacier are a constant threat during May and glacier ice continues to pose a threat throughout the season. While low water conditions are not uncommon each May, low water conditions in 1999 persisted much longer and likely affected salmon entry into freshwater as well as migration timing upriver.

Species apportionment between sockeye and chinook salmon is not performed for the sonar counts made at Miles Lake. When the return is in full swing, the inriver ratio of sockeye to chinook salmon approaches 100 to 1. The two species' migration patterns are dissimilar and the current sonar counters do not have the ability to apportion counts by species. Chinook salmon also have a tendency to migrate further offshore outside of the ensonified zone as compared to sockeye's near shore migration habits. The migration time for salmon to travel from the commercial fishing district to the sonar site is estimated to range from four to nine days depending on the water level of the Copper River.

In 1999, processors buying Copper River salmon were paying extraordinarily high prices, especially for chinook salmon, and permit holders were concerned that the department was managing the fishery too conservatively when actual harvests were meeting the projected harvests so closely for the first two weeks of the fishery. Abundance based management certainly supported a more aggressive fishing strategy however, sonar counts were just becoming available and initial daily escapement numbers appeared to be far less than anticipated. The low water level and the uncertainty as to how many salmon were already in the river above the fishery but below the counters supported a conservative management approach. Peak sockeye harvests for the Copper River traditionally occur during statistical weeks 23 and 24. The next announcement was on May 26 and established a 24-hour fishing period for what was expected to be the peak harvest period for sockeye salmon. The harvest for the May 27-28 period was 102,698 sockeye salmon and 10,338 chinook salmon compared to a projected harvest of 119,652 sockeye and 7,053 chinook salmon. The reported sockeye harvest from inside-statistical areas significantly increased during this 24-hour period indicating that sockeye salmon were now entering the estuary and mainstem of the Copper River. However, escapement counts past Miles Lake were still below the anticipated. By Saturday, May 29, the date of the next announcement, daily passage past the Miles Lake sonar counter had begun to increase. The daily passage for May 29 was 2,457 fish. This daily passage rate approximately matched the anticipated counts for May 23 and was interpreted positively that daily counts would continue to increase as a result of the initial conservative management strategy of four 12-hour periods. The next 24-hour period was announced for Monday, May 31. Indeed, on May 30, the daily passage rate increased to 6,194 fish, bringing the cumulative count to 13,051 fish versus an anticipated count of 50,745. If daily counts continued to increase, the current deficit could be corrected by shortening one or two fishing periods. The May 31-June 1 fishing period saw a harvest of 106,090 sockeye and 11,086 chinook salmon. While the actual harvest of sockeye was close to the anticipated harvest of 101,573, the chinook harvest was approximately twice the projected harvest of 4,998. Again, the sockeye harvest in inside waters had increased significantly over the earlier harvest period's sockeye catches.

Unfortunately, following the daily passage of 6,194 on May 30, daily passage rates began to decline and remained at exceptionally low levels for the next seven days. Counts on May 31 declined to 3,610 fish. In response to the downturn in the daily passage rate, the next fishing period on Friday, June 4 was reduced to 12-hours. The June 4 harvest was 83,850 sockeye and 5,143 chinook salmon. During the first week in June, daily counts of 1,800 to 2,800 were well below the anticipated daily counts of 10,000 to 14,000 fish. The next announcement on June 5 cancelled the following Monday's fishing period.

The commercial fishery remained closed for two consecutive fishing periods from June 5 to June 14 in order to improve escapement counts past the Miles Lake sonar. On June 9, the early season deficit at the sonar counter peaked at 118,000 fish. Eventually, the daily passage past the counter responded to the closure, which coincided closely with a sharp increase in the water level of the Copper River. Water levels began a marked rise on June 4 and by June 11 the water level finally matched the historic mean for the first time all season. Peak daily passage past the sonar occurred on June 11 when 27,063 fish were counted. In a normal season, peak counts would be anticipated to occur on June 8, when 14,382 fish were projected to pass the sonar counter.

The first aerial survey of the Copper River delta was flown on June 4. Similar to stocks returning to the upper Copper River, the timing of delta sockeye salmon stocks appeared to be delayed and very few fish were seen. On the second survey on June 11, 3,207 sockeye salmon were counted versus an anticipated count of 8,082 fish. During the third survey on June 18, 8,373 sockeye salmon were counted versus an anticipated escapement of 20,251 fish.

With a full 9 day closure between June 4 and June 14, inriver escapement was believed to have been bolstered enough to begin making up the deficit at the sonar counter. With the exception of four days in early July, after June 10 the daily sonar counts exceeded the anticipated counts for the remainder of the season. The actual cumulative sonar counts matched and surpassed the projected counts on June 24. Commercial fishing recommenced with two consecutive 12-hour fishing periods on June 14 and June 18. With the sonar counts improving but still showing a deficit and delta sockeye salmon escapement counts below the anticipated level, fishing periods were kept at 12-hours until escapement numbers had improved. The combined harvest for these two fishing periods during statistical week 25 was 123,319 sockeye and 3,357 chinook salmon.

By the date of the fourth aerial survey on June 26, Copper River delta escapements had improved and weekly escapement goals were now being met. The actual aerial estimate on June 26 was 26,881 sockeye salmon versus an anticipated escapement of 25,752 fish. Delta sockeye salmon escapements exceeded weekly projections for the remainder of the season and it appears that the nine day closure in early June simultaneously benefited the escapements for both upriver and delta stocks. By seasons end, the peak aerial survey estimate for sockeye salmon escapement to the Copper River Delta was 13% above the anticipated level of 89,050 fish.

Actual cumulative sonar counts exceeded the projected cumulative sonar counts on June 24. Concurrently, Copper River Delta sockeye salmon escapements were exceeding weekly escapement goals. Therefore, fishing time for the drift gillnet fleet increased to two 36-hour periods per week from July 1 through July 16. The season's peak sockeye harvest period occurred during the 36-hour period on July 1-2 when 150,144 sockeye salmon were harvested. This was the first time that a July harvest period in the Copper River District was the season's peak period. Generally, the peak sockeye harvest will occur during late May or early June when upriver wild stocks are at their peak. Owing to the combined strength in 1999 of

Copper River Delta stocks and the Gulkana Hatchery stock, which share a similar run timing, the sockeye salmon harvest in July was exceptionally strong. Even with the increased fishing time and resultant strong harvest, both upriver and delta escapement goals continued to be met or exceeded. Fishing time was increased to two 48-hour periods per week from July 19 through July 31. By late July, the sockeye salmon harvest was winding down and fishing effort had decreased to less than 200 permits fishing. Peak fishing effort in the Copper River District occurred during the June 4 fishing period when 506 drift gillnet permits were recorded as having fished. After June 4, effort steadily declined as other Prince William Sound gillnet districts were opened for the season. Peak effort in July was on July 1 when 399 permits fished. By the end of July, effort had dwindled to 164 permits fishing in the Copper River District. When the Miles Lake sonar counter ceased operations on August 3, the cumulative escapement past the counter was 850,951 versus an escapement objective of 723,918. Salmon passage past the counter on the last day of sonar operation was over 7,000 fish per day.

Coho Salmon Fishery, Season Summary

The Copper River District's coho salmon harvest of 153,000 fish was 50% below the projected harvest of 304,000. The annual projected harvest is based on the recent ten-year average harvest. The coho season officially began at 12:00 noon on August 9 with a single 24-hour period that week. When coho escapements can support it, two fishing periods per week has been the most recent recommendation from the Salmon Harvest Task Force. Deciding on the most appropriate fishing strategy to apply to the coho salmon return has been a contentious issue for the past few seasons. In order to maximize quality, processors universally prefer two shorter 24-hour periods per week. Fishers tend to prefer a single, longer fishing period per week, both for logistical reasons and for conservation reasons. Two distinct fishing periods per week will potentially allow for two "clean up" harvests to occur when milling fish are more effectively harvested. Their contention is that a single long weekly period will allow a broader window of time for fish to mill in the estuary and still escape the fishery. Arriving at a consensus over harvest strategy between processors and fishers has proven to be difficult to achieve. Overriding the concern for which would be the best harvest strategy for coho salmon has been the concern about the pattern of weak returns to the Copper River District since 1996. The past three years have seen harvests falling well below projections and seasons ending prematurely due to weak returns. In 1997, coho salmon escapement into delta streams was weak enough to impose a coho salmon bag limit reduction for sport fishers. In 1998, weather during the fall precluded an accurate assessment of coho salmon escapement for the year. Because of the recent history of poor coho returns and inconclusive escapement data, the department intended to approach the season with extreme caution. The initial harvest strategy would be a single 24-hour period per week until escapements could justify additional fishing time and harvest data continued to indicate there was some strength to the return. The actual harvest from the first coho salmon opening on August 9 was 5,358. The anticipated coho salmon harvest for the previous week was 3,632 coho salmon. For the week ending Saturday, August 14, the anticipated harvest was 11,691. With the actual harvest falling midway between these two figures, it was appropriate to schedule another coho opening for Monday, August 16.

An aerial survey on August 10 counted approximately 2,000 coho salmon versus an anticipated count of 4,400. During this survey, over 60,000 sockeye were also counted. Early in the coho return there was some difficulty in discriminating coho salmon from the numerous sockeye salmon. Species differentiation became easier in subsequent surveys. The next survey on August 17 was flown under poor conditions with high, muddy water encountered in many systems. Less than 1,000 coho were counted versus an anticipated count of 6,200. Coho escapement was likely higher than what was actually observed.

The second commercial fishing period resulted in a harvest of 22,434 coho salmon versus a projected harvest of approximately 25,070 for that week. The female percentage measured from the harvest was estimated to be 29% whereas the predicted female percentage was 43% for that date. The magnitude of the harvest and the female percentage being below the anticipated supported the decision to continue with the commercial harvest strategy, but the uncertainty over the actual strength in the escapement warranted maintaining the conservative approach of limiting openings to a single 24-hour period per week. The next opening on August 23 resulted in a harvest of 51,179 coho versus an anticipated harvest of 47,446 fish. The female percentage of 34% was again lower than the predicted percentage of 51% for that date. The next aerial survey flown on August 25, again under less than ideal conditions, saw 4,365 coho versus an anticipated escapement of 12,200. Both the escapement counts and the female percentage indicated the return was tracking later than normal with both indicators matching their respective indexes for the period roughly 10 days earlier. A fourth 24-hour period was announced for Monday, August 30. The harvest for August 30 decreased to 40,568 coho salmon versus an anticipated harvest of approximately 63,000 fish. In addition, the female percentage measured from the harvest rose sharply to 52%, much closer to the anticipated percentage for that date of 57%. The decrease in the harvest, especially when effort increased to 264 permits from the previous periods effort of 238 permits fishing, and the increase in the female percentage to near predicted levels justified halting the schedule of openings until escapement numbers improved.

The next aerial survey was flown on September 8 when 18,112 coho were counted under poor survey conditions. The anticipated escapement count was 42,000 coho salmon. Escapements appeared strong in Martin River Slough, Bering River, Bering Lake, and the Katalla River but escapements in most other systems were well below the desired level. Poor weather prevented weekly aerial surveys between September 9 and September 27. Without current escapement information, the department's management strategy was to delay additional commercial harvesting until the predicted peak harvest periods had passed and these fish had the opportunity to augment wild stock escapement. Without the prospect for weekly harvest periods, some processors indicated they would cease operations for the season. This action would displace some permit holders who might not have a market.

Weekly 24-hour fishing periods resumed after the 16-day closure with a commercial fishing period on September 16. The long closure resulted in decrease in fishing effort to 77 permit holders. The harvest was 9,168 coho salmon and the female percentage was 62%. Measured female percentages rarely exceed 65% and, at this level, indicated the return was at least 80% complete. The next period saw a harvest of 8,776 coho salmon by 67 permit holders. Weather generally remained unfavorable for both fishing and flying during September. The next aerial survey, flown on September 28, counted 45,275 coho salmon. Peak coho salmon counts were expected to have been made during mid-September to late September and the survey numbers on September 28 were fairly close to the peak anticipated count of 50,000 coho salmon. This was the last aerial survey flown for the season and the coho escapement was within the target range at that time. Two additional commercial openings took place on September 30 and October 7, which resulted in a harvest of 3,210 additional coho salmon. The salmon season ended following the close of the October 7 fishing period.

Bering River District

Preseason Outlook and Harvest Strategy

The 1999 harvest forecast for the Bering River District was 20,000 to 30,000 sockeye salmon and 127,500 coho salmon. Commercial fishing periods in the Bering River District generally coincide with the Copper

River District. The Bering River District escapement index goal is 32,000 for sockeye salmon and 22,200 for coho salmon.

The sockeye salmon harvest of 13,697 was below the preseason projection and less than the recent ten year average of 19,444. The observed escapement indices for the Bering River District were 46,195 for sockeye and 31,090 for coho.

Season Summary

The Bering River District generally opens the second or third week of June. In 1999, the first period was Monday, June 14. The first salmon were seen in the Bering River District during the June 18 survey when 3,200 sockeye were observed in the Bering River versus an anticipated index count of over 8,000. The two 12-hour periods the week of June 14 resulted in a harvest of 7,950 sockeye salmon. Concurrently with the Copper River District, the Bering River District remained closed for the first period the following week.

During an aerial survey on June 26, 19,400 sockeye salmon were observed versus an anticipated index count of 12,810 fish. Following the June 26 survey, aerial index counts were close to or exceeded anticipated counts for the remainder of the season. Ongoing positive escapement indices allowed for increased fishing time in the Bering River District for the remainder of the sockeye salmon season.

Coho Salmon

The coho salmon fishery is managed concurrently with the Copper River and coho management typically begins in early August. The first commercial fishing period for coho salmon in the Bering River District occurred on August 9 and attracted less than three permit holders. Effort remained low until the August 30 fishing period when 36 permit holders landed 6,572 coho salmon. The significantly lower than anticipated catch despite an increase in fishing effort, a sharp rise in the female percentage, and escapement indices trailing the desired level in the district resulted in the Bering River District closing for the remainder of the season after the August 30 fishing period.

Coghill District (Prior To July 21)

Preseason Outlook and Harvest Strategy

The management strategy prior to July 21 (gillnet only fishery) is concerned primarily with the return of sockeye salmon to Coghill Lake and the return of chum salmon to the Wally Noerenberg Hatchery (WNH). Coghill sockeye are managed for an escapement goal of 25,000, while hatchery chum are managed to satisfy the allocation between the common property fishery and Prince William Sound Aquaculture Corporation's (PWSAC) corporate escapement.

The forecast for the 1999 Coghill Lake sockeye salmon return was 72,800 fish of natural stock origin. In addition, PWSAC released pre-smolt into the lake 1995 although they were expected to add very few fish to the return. There was no formal forecast completed for this component of the Coghill Lake return due to a lack of information on pre-smolt to adult survival for Coghill Lake sockeye salmon.

The department's point estimate for the Noerenberg Hatchery chum salmon return was 2.4 million fish. PWSAC had a revenue goal based cost recovery plan for 1999 that sought to harvest \$2.3 million from non-pink species. Due to the anticipated weakness of the sockeye salmon returns to Main Bay Hatchery as a result of the pipeline break a few years ago; PWSAC would rely heavily on the chum return to WNH to achieve their non-pink revenue goal. Preseason estimates were that as many as one million chum salmon would be needed to help satisfy the revenue goal with an additional 127,000 fish needed for broodstock. The actual number harvested for corporate escapement would depend on the average size and the price per pound PWSAC received for their fish. Some of PWSAC's preseason contracts linked the price they would receive to the grounds price paid to commercial harvesters once the season opened.

The total harvest for both the common property and the corporate catch of chum salmon was 2.23 million fish, which was close to the preseason forecast of 2.36 million fish. The common property harvest of early chum salmon was 1,310,559 fish. PWSAC harvested 775,552 chum salmon for sales and the broodstock goal of 127,000 fish was achieved. The total commercial harvest of sockeye salmon in the district was 109,257 fish. Sockeye salmon escapement into Coghill Lake totaled 59,311 fish, exceeding the goal by 34,311 fish. A total of 155,923 pink salmon were counted past the Coghill River weir. Peak pink salmon passage occurred between July 30 and August 4 when 91,572 pink salmon crossed the weir during a six-day period.

Season Summary

For the Coghill District, the management strategy discussed at the March SHTF meeting indicated that, because of the weak Main Bay Hatchery returns in 1999, PWSAC's chum salmon cost recovery harvest would initially be allowed to proceed longer than in previous seasons. Front end loading the cost recovery harvest would allow the department to begin to assess the strength of the early portion of the chum return and allow PWSAC to maximize revenue when values were high. For the past few years, a trigger of 15,000 - 20,000 cost recovery chum salmon was used to initiate common property harvesting in the Coghill District. This harvest level was typically achieved around June 12. In 1999, the cost recovery harvest area for PWSAC was expanded to include waters outside the SHA and inside of a line 0.5 miles seaward from Hodgkins Point to Esther Light. Some salmon appear to mill outside the THA and SHA for a period prior to moving closer to the hatchery. Allowing the cost recovery harvest to occur outside the SHA would hopefully help maintain a higher quality terminal harvest and speed up the pace of early cost recovery harvesting. The 1999 strategy for cost recovery harvesting was similar to 1998's by being aggressive on the early portion of the return and using two seine boats for corporate harvesting. PWSAC began monitoring the return in late May but did not actually record a harvest until June 4. Due to the record number of three-year-old chum that returned in 1998, a large component of age-4 chum salmon were expected to contribute heavily to the 1999 return. These younger aged chum salmon generally return later in the season than age-5 and age-6 chum salmon. PWSAC's having adopted a new rearing practice appears to have successfully influenced chum survivals but complicated accurately forecasting the 1999 chum return. The large component of age 3 chum salmon in 1998 was potentially due to PWSAC having reared the smolt to a much larger size prior to release. It remains unclear if the sibling relationship used to model previous forecasts would remain unchanged in light of new rearing strategies. If survivals were indeed enhanced, a large component of age 3 and age 4 chum salmon would likely be the result in 1999. PWSAC's forecast was less optimistic than the department's, anticipating a total return of 1.7 million fish. PWSAC was concerned that if they banked their cost recovery harvest on the later timed chum salmon they would not meet their revenue goal if the younger age classes failed to materialize. In addition, the price of chum salmon tends to drop after early July, which would increase the number of fish PWSAC would need to meet their 1999 revenue goal. As a result, PWSAC was conservative in their management

recommendations to the department, preferring to have the hatchery return managed based on their conservative forecast rather than risking their cost recovery on the later and younger aged component of the return.

PWSAC began harvesting at Noerenberg Hatchery on June 4 (Appendix F.1.). By the time of the first commercial opening on June 14, they had harvested 136,000 chum salmon, or 13% of their anticipated goal. The first commercial opening in the Coghill District attracted 127 drift permit holders who harvested 65,449 fish in a 24-hour period (Appendix C.1.). Waters of the Coghill District south of 61°00.00 N. latitude were opened for the first period and the sockeye salmon harvest was only 431 fish. In contrast, the first Coghill District opening in 1998 was on June 15 and saw a harvest of 115,875 chum and 358 sockeye salmon by 186 permit holders. This season, the Coghill weir was installed on June 5 and the first 7 fish passed the weir on June 14 (Appendix C.3.). The anticipated cumulative Coghill weir escapement for June 14 was 161 sockeye salmon.

The second commercial opening occurred on June 18 for 12-hours in the same area as the first period. The time was reduced to improve the number of fish available for PWSAC's cost recovery harvest. Effort for the second period dropped to half that of the first period, due in part to the reduced time but also due to the continued high prices being paid in the Copper River District for sockeye and chinook salmon. The common property harvest was 55,693 chum and 310 sockeye salmon. PWSAC's June 15-17 harvest was 33,000 chum salmon, bringing them to approximately 25% of their non-pink revenue goal. PWSAC felt that the age-4 and age-5 components of the return were weaker than forecast and wanted the department to maintain a conservative harvest strategy with the drift gillnet fleet. The third commercial opening occurred six days later on June 24 for 24 hours, disrupting the twice-weekly schedule of 24-hour openings to improve PWSAC's cost recovery prospects. The area within the Coghill District that was open to the drift gillnet fleet was reduced to waters south of 60°50.75 N. latitude in response to the low numbers of sockeye in the harvest and at the weir at Coghill River. Cumulative weir passage on June 23 was 127 sockeye salmon versus an anticipated count of 3,215 fish. Fishing effort rebounded from the previous period's decline with 132 permit holders harvesting 132,000 chum and 2,322 sockeye salmon. The fourth fishing period was for 12-hours and occurred on June 28. The harvest was 73,500 chum salmon and 2,370 sockeye salmon by 111 permit holders. The open area for the fourth period remained the same as the third opening. PWSAC's corporate harvesting had begun to significantly improve after the third common property opening. By June 26, PWSAC had harvested 519,000 chum salmon, received better than anticipated prices for their fish and had achieved approximately 68% of their non-pink revenue goal.

Chum salmon run entry had significantly improved by the last week in June and it was clear that PWSAC would soon achieve their non-pink revenue goal. Between June 27 and June 29 PWSAC harvested 232,525 chum salmon and reached their non-pink revenue goal on June 30. With strong run entry into the Noerenberg Hatchery THA and SHA, and with PWSAC's terminal area harvesting almost complete, the department and PWSAC felt it would be necessary to quickly resume common property harvesting once PWSAC was finished harvesting. After polling processors that were buying chum salmon from the common property harvest, the department established a schedule of openings for the Coghill District. On June 30, a day-on, day-off schedule of 14-hour openings was announced beginning on Wednesday, June 30. The first 14-hour opening that same day provided relatively short notice to the drift gillnet fleet and deviated from the traditional Monday / Thursday schedule of openings. But because PWSAC was no longer harvesting in their SHA and would only be collecting broodstock fish, a quick resumption of common property harvesting was necessary to forestall putting too many chum salmon into the hatchery terminal area.

Weir numbers at Coghill Lake were still below the anticipated as of June 30. Sockeye salmon escapement past the weir was 866 fish versus an anticipated count of 5,020 fish. Therefore, the open area for the scheduled fishing periods was restricted to the THA and waters within one nautical mile of the southern half of Esther Island. As Coghill Lake escapement improved, additional area would be opened. The schedule of every other day openings was the predominant preference of area processors and was chosen to maintain quality for as long as possible. The initial opening the evening of June 30 saw 84 permit holders harvest 41,269 chum and 2,523 sockeye salmon. To date, the common property harvest of sockeye salmon in the Coghill District stood at 8,000 fish. The next 14-hour opening occurred on July 2 when 60 permit holders harvested 40,810 chum and 2,897 sockeye salmon. On July 2, the daily passage rate had begun to improve at Coghill weir with 528 fish passing the weir. The sockeye salmon escapement at Coghill Lake stood at 1,643 versus an anticipated count of 6,699.

The third 14-hour period was scheduled for Sunday, July 4 from 8:00 a.m. to 10:00 p.m. The fishing period began as scheduled but was extended and the entire Coghill District was opened after the weir crew at Coghill River reported that they had passed over 20,000 sockeye in less than a 12-hour period. On July 4, the department announced at 7:30 p.m. that the current 14-hour fishing period would be extended for 48-hours and that waters up to the mouth of the Coghill River would be open. The emergency order extending the July 4 opening and broadening the area open to fishing was issued in deference to the problems that Coghill Lake has experienced from over escapement in the 1980's when multiple years of escapements exceeding 140,000 sockeye salmon had dramatically reduced the lake's productivity. Coghill Lake has recently benefited from a five-year fertilization project designed to restore its productivity. A significant over escapement had the potential to minimize these benefits and the department decided that it was in the best interest of the resource to extend the current fishing period and minimize sockeye salmon escapement into Coghill River as quickly as possible. An extension of the ongoing fishing period would take advantage of the harvest and tendering capacity that was already in place in the Coghill District. A 24-hour opening was scheduled to begin the next morning in the Copper River District and gillnet boats were in the process of departing the Cordova harbor for the Copper River flats. By announcing an extension on the evening of July 4, some of these boats could more easily elect to travel to the Coghill District, as a percentage of them did.

Between July 4 and July 6, 36,684 sockeye salmon passed the weir at Coghill River. During the 62-hour fishing period over the same dates, 105 permit holders harvested 36,861 sockeye and 103,287 chum salmon. Following the 62-hour period, the Coghill District was open continuously using four alternating periods of 72 and 96-hours. This fishing schedule was maintained until July 20.

Fishing effort steadily declined in the Coghill District, dropping from 115 drift gillnet permit holders during the July 6-9 period to 13 drift gillnet permit holders on July 20. The decline in drift gillnet effort was partially a result of the record number of three year old chum salmon returning to Noerenberg Hatchery. A significant buildup of chum salmon had begun to form in Lake Bay in front of Noerenberg Hatchery. Gillnets deployed there would have been difficult to retrieve and processors had begun to direct their boats to target bright fish away from the hatchery terminal area. While numerous high quality chum salmon were still available for harvesting outside the terminal area, harvesting outside the THA would do little to alleviate the surplus that was forming in the hatchery SHA. In 1996 the Board of Fish, in response to previous unharvested surpluses of enhanced chum salmon, granted the department the authority to open the hatchery SHA to seine gear prior to July 21. On July 10, seiners were given permission to harvest excess chum salmon from the hatchery SHA that were not being adequately harvested by the drift gillnet fleet. Waters of the SHA were opened to seine gear for 6-hours per day, every other day between July 10 and July 20. During these six 6-hour periods, seiners harvested 577,000 chum salmon. Processors offered

relatively low prices for these fish from the SHA due to their reportedly low quality. However, processors that had previously been buying bright chum salmon from the gillnet fleet elected to fill their tenders from the seine harvest in the terminal area. This action disenfranchised a number of gillnet permit holder who no longer had an outlet for their fish. As a result, drift gillnet effort declined rapidly after July 10 to only 13 permit holders on July 20. The drift gillnet fleet harvested 689,210 chum and 106,028 sockeye salmon in the Coghill District in 1999 while the seine fleet harvested 621,349 chum salmon. Peak gillnet effort occurred on June 24 when 132 permits were fishing. A total of 239 drift gillnet permit holders fished at least once in the Coghill District in 1999. Peak seine effort during the chum harvest was 10 permit holders on July 10.

After meeting the sockeye salmon escapement goal on July 4, the department elected to harvest sockeye salmon at Coghill weir to further reduce the number of reds escaping into the lake. With the assistance of area processors, the department harvested 9,372 sockeye salmon at the weir. Proceeds from the sale of these fish were used to fund the operation of the Eshamy weir, which has not been funded for the past two years, and for conducting upriver aerial surveys along the Copper River. In addition to the departments harvesting efforts, the sport fish bag limit at Coghill River was increased to 12 fish and a number of anglers were able to benefit from the strong return to Coghill Lake. While the sockeye salmon return to Coghill Lake was over twice the forecasted amount, the return to Eshamy Lake was only forecast to have a return of 38,000 fish with an escapement goal of 40,000. With the Coghill return being twice the forecasted amount, a weir at Eshamy River would be extremely helpful in managing the wild stock sockeye salmon return to that system. In the absence of escapement information, it was likely that an overly conservative management strategy would be employed. If the return was above forecast, a conservative management approach would have resulted in lost opportunity for common property harvesters in that district.

Unakwik District

The 1999 Unakwik District harvest was 8,930 sockeye salmon with incidental harvests of chum and pink salmon (Appendix C.9.). The sockeye salmon harvest exceeded the 10-year average harvest of 6,500. The Unakwik District opened June 24 on a schedule of two 24-hour periods per week, primarily targeting the sockeye salmon return to Miners Lake. On June 28, the schedule was changed to coincide with openings in the Coghill District. No changes were made to the concurrent fishing schedule until July 6 when the district reverted back to the customary schedule of two 24-hour periods per week. The last reported harvest occurred on July 9. On September 3, the Unakwik District closed for the season.

Eshamy District

Preseason Outlook and Harvest Strategy

The 1999 forecast of Main Bay Hatchery's sockeye salmon was approximately 140,000 fish. This total was composed of 8,600 fish of Eyak stock origin, 19,600 fish from the Coghill stock and 111,000 fish of Eshamy stock origin. The hatchery is switching back to a single stock facility and is eliminating both their Eyak and Eshamy brood. The Eshamy wild stock return was forecast to be 38,000 sockeye salmon, all of which were needed for escapement.

PWSAC was planning to achieve their non-pink revenue goal from their Noerenberg Hatchery chum salmon production and using all of their Main Bay Hatchery Coghill stock for broodstock. Eyak stock production has generally been less than forecast and would likely go unharvested. If PWSAC were to successfully achieve their non-pink revenue goal with chum salmon, the entire return of enhanced Eshamy

stock would be made available for a common property harvest. However, with a relatively weak wild stock return forecast for Eshamy Lake, it was unlikely that a general Eshamy District common property opening would occur in 1999. It was announced preseason that the department would potentially allow harvesting to occur in the northern half of the Crafton Island Subdistrict during the enhanced return of Eshamy stock to Main Bay Hatchery.

Following the loss of Exxon Valdez oil spill funding, the Eshamy weir has been intermittently funded using ADF&G test fish revenues. During the SHTF in March, the department announced that the Eshamy weir would again not operate unless new funds from a test fishery were secured. In 1998, the department had suggested that \$28,000 in revenue for the Eshamy weir project could come from a bid process involving the harvest of sockeye salmon in the Copper River District. Lengthy discussion in the SHTF followed. Representatives to the SHTF decided that no test fish revenues should be generated from any of the Area E salmon fisheries. Without funding, the Eshamy weir did not operate in 1998 and it appeared likely it would not operate in 1999. However, unanticipated revenues were secured from the July harvesting at Coghill weir that procured enough funds to operate the Eshamy weir in August.

By seasons end, the common property harvest of sockeye salmon was 160,410 fish. The broodstock goal for Coghill stock sockeye was achieved. Surplus Coghill and Eshamy stock sockeye salmon stock were harvested by the drift and set gillnet fleets.

Season Summary

Coghill broodstock began arriving at Main Bay Hatchery in mid-June. Once sufficient broodstock were estimated to be adjacent to the hatchery, the barrier seine would be installed and common property harvesting could commence. The barrier seine was installed on July 13 and the first common property opening occurred on July 15-16 (Appendix D-1). A schedule of two 36-hour periods per week was maintained the entire season, which ended September 7. The scheduled openings between July 16 and August 12 included waters north of the anadromous stream marker on the north side of Loomis Creek. This boundary effectively kept Eshamy Bay closed while allowing the drift and set net harvesters room to target the enhanced Coghill and Eshamy stocks returning to Main Bay Hatchery. Beginning August 12, only waters of the Main Bay Subdistrict were opened. The reduced area was in response to the low escapement at Eshamy weir during the peak of the wild stock return. The alternating gear zone was included in the openings after August 8 once the Coghill broodstock entered freshwater and the barrier seine was removed.

The peak harvest period occurred on August 2 when 25,029 sockeye were harvested by 18 setnet and 42 drift gillnet permit holders. In total, 21 setnet and 104 drift gillnet permit holders participated in the Eshamy District harvest in 1999. Preliminary coded wire tag data indicated that, as late as the August 5-6 fishing period, Main Bay's Coghill stock was still contributing 36% of the sockeye salmon harvest. The remainder were enhanced Eshamy stock. No wild stocks could be accounted for with coded wire tag data during that period.

The Eshamy weir became operational on August 1 and 4 sockeye salmon were passed that day (Appendix D.3). Few fish were seen milling in the river's estuary. The weir was kept in until September 16 and the total escapement at seasons end was 27,057 sockeye salmon, 32,756 pink and 194 coho salmon. An unknown number of sockeye salmon may have entered the lake in July prior to the weir's installation. Historic run timing would estimate that approximately 8,000 sockeye would enter the lake in July but it is

believed unlikely that this many fish were present early in the season. Periodic reports from anglers and Eshamy residents did not indicate that numerous fish were present in Eshamy lagoon during July.

General Purse Seine Districts

Preseason Outlook and Harvest Strategy

The general purse seine districts include the Eastern, Northern, Unakwik, Coghill, Northwestern, Southwestern, Montague and Southeastern Districts. The Prince William Sound Management and Salmon Enhancement Allocation Plan (5 AAC 24.370) closes the Southwestern District prior to July 18. The plan also closes the Coghill District to purse seine gear prior to July 21, except under the Wally Noerenberg Hatchery Management Plan (5 AAC 24.368(f)), the Esther Subdistrict may be opened to seine gear to prevent deterioration of fish quality of the harvestable surplus of chum salmon that is not being adequately harvested by the drift gillnet fleet. Beginning July 21, both purse seine and drift gillnet gear are allowed in the Coghill District. Seine gear is allowed in the district as long as the harvestable surplus is predominantly pink salmon by number. Fishing periods in all districts are established by emergency order.

The general purse seine districts are managed to achieve wild pink and chum salmon escapement goals by district and allow for the orderly harvest of surplus wild and hatchery stocks. Escapement of pink and chum salmon is tracked through the season by weekly aerial surveys of 209 index streams. Management to achieve hatchery corporate escapement goals is accomplished by opening and closing subdistricts near the hatcheries. Subdistrict openings are also utilized to target the fleet on hatchery stocks when wild salmon escapement is weak.

The Valdez Fisheries Development Association's (VFDA) Solomon Gulch Hatchery has a stock of pink salmon that peaks in early July and a run of coho salmon that begins in August. All of VFDA's enhanced production returns to the Solomon Gulch Hatchery in Port Valdez, with the exception of a small run of coho salmon that returns to Boulder Bay near the Village of Tatitlek.

The PWSAC pink salmon stocks peak in mid-August. Their pink salmon return to Cannery Creek, WHN and A. F. Koernig (AFK) Hatcheries. A moderate run of coho salmon at WHN Hatchery is incidental to the late pink salmon fishery. The outlook for the general purse seine fishery in 1999 was for a total return of 32.7 million pink salmon composed of 26.1 million hatchery and 6.6 million wild stock pink salmon (60% PWSAC, 20% VFDA, 20% wild) (Appendix A.10). The forecasted common property fishery harvest was 19.6 million pinks with an additional 11.7 million slated for corporate escapement and 1.4 million needed for wild stock escapement. The wild stock chum salmon forecast called for a total return of 610,000 fish with an escapement goal of 225,000. The forecast for enhanced chum salmon in seine districts was 310,000 fish returning to a remote release site in the Montague District.

When the Prince William Sound Salmon Harvest Task Force (SHTF) met prior to the fishing season, seine representatives on the task force reviewed changes to the fishery being considered for the 1999 season and made recommendations on management strategies to incorporate these anticipated changes. Strong statewide return forecasts, poor market conditions, catch limits, and low prices caused a great deal of concern over the potential for a successful seine season. There was significant concern preseason that above average returns of pink salmon could exceed processor's interest in purchasing PWS pink salmon. Seine effort the last few seasons has been greatly reduced due to the anticipated low prices. The SHTF felt that the remaining seiners would likely concentrate their fishing effort and target hatchery returns where high volume harvests could occur. With a strong wild stock pink salmon forecast and a reduced seine fleet,

the department agreed to open a majority of the Eastern District during seine periods targeting the pink return to Solomon Gulch Hatchery. This would help to relieve congestion in the Valdez Narrows Subdistrict where a majority of the VFDA return has traditionally been harvested. The department also agreed to fish earlier in the Southwestern District if the early wild stock returns indicated a strong wild stock run.

VFDA's 1999 Annual Management Plan for the Solomon Gulch Hatchery called for their pink salmon return to be managed to meet a \$2.8 million revenue goal. Fish determined to be surplus to the association's needs would be made available for common property harvesting. In 1999, two processors had contracts to purchase VFDA's cost recovery salmon. The cost recovery fishermen had contracts that required them to fish only on days when there was no common property fishery. Two processors operating at full capacity in 1999 would improve VFDA's prospects for efficiently achieving their cost recovery goal and allow for more timely common property openings targeting surplus enhanced fish. However, without having the ability to cost recovery fish every day because of catcher boat contracts, it was determined that the best management strategy would be to allow VFDA to reach approximately 33% of their revenue goal prior to the start of a common property fishery. This strategy would accomplish three goals: 1. It would allow VFDA to reach their revenue goal in a timely fashion; 2. It would allow the department to assess the strength of the hatchery run and; 3. It would allow early run wild stocks to escape into their natal streams.

According to PWSAC's annual management plans, the corporate escapement goal for pink salmon was based on broodstock needs of approximately 900,000 fish and a revenue goal of \$3.7 million. The department would collectively manage the pink salmon returns to WHN, Cannery Creek and AFK Hatcheries to achieve the goal. Fish estimated to be surplus to the corporation's needs would be made available for a common property harvest. PWSAC's contract seiners were required to fish every day that fish were available for harvest so no attempt would be made to get a large percentage of the cost recovery complete before allowing a common property fishery to occur.

Chum Salmon, All Seine Districts

The wild and enhanced chum salmon returns to PWS were strong and the areawide chum salmon harvest set a record in 1999 (Appendix E.9). Seiners were able to target wild chums in the Eastern and Southeastern Districts and enhanced chum salmon returns in the Montague, Southwestern and Coghill Districts. This year was the first time that all age classes of chum salmon returned to the Port Chalmers remote release site in the Montague District. The harvest of just over 600,000 fish was twice the forecasted number. A fishing schedule of two periods per week was initiated on June 2. Sixty-hour fishing periods began on Wednesdays at 8:00 a.m. with a 12-hour closure on Friday nights followed by an 84-hour open period beginning on Saturdays at 8:00 a.m. This schedule was maintained through July 16. Additional fishing periods of shorter duration and smaller area occurred after that date to harvest surplus enhanced chum salmon and protect arriving wild stock pink salmon. This year was the first year that chum salmon returned to the AFK hatchery from two years of stocking in what was an attempt to establish a chum salmon return at that facility. At the time of stocking, PWSAC hoped to be able to cost recover most of the adults and take eggs for their Port Chalmers remote release site. After two years of stocking, that program was abandoned, but the adults still remain to return. Common property periods were announced inside the AFK Hatchery Special Harvest Area (SHA) on July 20, 22, and 25, which were concurrent with other district openings, to harvest the three year old chum salmon that had built up at the hatchery as these fish were beyond PWSAC's cost recovery needs. A total of 7,000 chum salmon were harvested at that location which was twice the preseason forecast. The return of chum salmon to the WHN Hatchery came in just below the preseason forecast of 2.4 million adults. This was the first year that the Board of Fisheries

(BOF) approved change in the WHN Hatchery Management Plan was utilized that allowed seiners to harvest enhanced chum salmon in the Esther Subdistrict for the purpose of preventing deterioration of fish quality of chum salmon not being adequately harvested by the drift gillnet fleet. Concurrent with the common property pink salmon fishery that opened July 10 in the Eastern District, a 6-hour period of common property purse seine fishing was allowed in the SHA of the WHN Hatchery to harvest surplus chum salmon prior to the deterioration of fish quality. These surplus chum salmon had not been harvested by the gillnet fleet. Ten seine permit holders harvested approximately 151,000 chum salmon in that 6 hour period. The complete lack of gillnet effort for chum salmon inside the WHN Hatchery SHA during the remaining opening periods warranted continued fishing by the seine fleet for surplus chum salmon. Six hour seine fishing periods opening concurrently with the Eastern District occurred inside the WHN Hatchery SHA every other day from July 10 until July 21, after which time purse seine gear became a legal gear for the entire district as pink salmon become the target species. Overall, wild stock chum salmon escapement exceeded the escapement goal in the Eastern, Northern and Southeastern Districts by 147%, 12% and 63%. These three districts comprise 68% of the expected chum salmon escapement goal in PWS. The other districts failed to achieve the expected goals, but on a sound wide basis, the chum salmon escapement was 50% over the goal (Appendix E.4, E.9 – E.12). The escapement of 1999 was the fourth highest escapement since 1965 and continues a trend of increasing escapements since 1995. It is possible that the chum salmon escapement in 1999 was greater in many of the PWS districts, but because of the overwhelming number of pink salmon, it was extremely difficult to see and enumerate these chum salmon during aerial surveys in streams where both species occurred.

Pink Salmon, All Seine Districts

The number of pink salmon that returned to Prince William Sound was much larger than the 32 million fish forecast and resulted in an all time high single season harvest of 45.0 million fish. The previous high single season harvest was in 1990 when 44.2 million pink salmon were harvested (Appendix E.2). The returning adults in 1999 were smaller than previous years with the average weight being approximately 3.0 pounds. An estimated 7.0 million wild stock pink salmon contributed to the commercial common property and cost recovery fisheries based on otolith recoveries. Approximately 98% of the wild stock harvest occurred in the commercial common property fishery. The ratio of enhanced pink salmon to wild pink salmon in the 1999 total commercial common property harvest is estimated to have been 3.6:1. An estimated 2.4 million pink salmon escaped into Prince William Sound index streams to spawn which ranks as the fifth highest escapement since 1960 (Appendix E.4 – E.8). Approximately 52% (139 permit holders) of the Area E salmon purse seine permit holders made at least one delivery during the 1999 season.

Aerial surveys to assess early chum and pink salmon escapements in the Eastern and Northern Districts began in late-June. In July, surveys began in all other seine districts. Similar to the 1998 season, most fishing effort was directed at the migration corridors used by hatchery fish. Open areas in the Eastern and Southeastern Districts outside these migration corridors were fished heavily this season during the lull between the early and late hatchery runs. Once the late run hatchery stocks started to arrive, these districts were abandoned for the more productive hatchery corridors even though large numbers of surplus wild stock pink salmon were still available for harvest. Processor imposed limits on the number of pounds of salmon each fisherman could deliver went into effect in late July and early August, which restricted the harvest of both hatchery and wild stock pink salmon. The peak effort occurred on August 12 and 14 when 126 permit holders delivered fish. The Southeastern District's pink salmon index escapement was 156% above the escapement goal and the Eastern District was 48% above its goal. In the Northern/Unakwik Districts, escapement was 68% above the escapement goal. The Northwestern and Coghill Districts were 37% and 5% below their respective midpoint escapement goals. However, weir counts at Coghill River (a

glacial system) had significantly higher pink salmon escapement numbers than were observed during routine aerial surveys. Pink salmon escapement past the Coghill River weir, located one mile upstream from the river mouth, exceeded 155,000 fish versus the season aerial count of 141,500 pink salmon for the entire system. However, the Coghill District did exceed the lower range threshold of the aerial surveyed escapement goal. The Southwestern District was 41% above its escapement goal for the season. The Montague District was 135% above its escapement goal and the Eshamy District finished the season 21% above its pink salmon escapement goal. Common property seine openings took place in every district except for the Northwestern District with most of the seine harvest taking place in those districts with high concentrations of enhanced fish. Despite commercial fishing in the Southwestern District earlier than last year and liberal district wide openings in wild stock areas, wild stock escapements met or exceeded the escapement goals in all, but the Northwestern District. The processor limits on their seine fleets in August restricted the catch during the peak of the late run season and resulted in large surpluses of hatchery pink salmon in the terminal areas. Wild pink salmon in excess of escapement needs were also left as a result of these limits.

Eastern District

VFDA began their corporate escapement harvesting on June 28 at the Solomon Gulch Hatchery using nine seine boats in their cost recovery fleet. The 1999 pink salmon revenue goal for VFDA was \$2.8 million. Based upon their sales contract with Peter Pan Seafoods and Northern Victor Seafoods, VFDA required approximately 13.5 million pounds of pink salmon to meet their revenue goal. Initial harvests were tracking about one week behind the anticipated run entry curve, and the average weight of pink salmon being harvested was approximately 3.1 pounds. It was not until July 5 before VFDA had attained 32 percent of their revenue goal. The percentage of female pinks in the sales harvest at this time was roughly 23%, indicating that the return was running about one week late. The first seine fishery in the Eastern District was announced for July 6 and included a majority of the Eastern District. A total of 717,000 pink salmon were harvested in a 12-hour period with nearly all the effort targeting the hatchery return.

VFDA resumed corporate sales harvesting on July 7 and continued until the next common property opening on July 10. The second 12-hour opening saw 77 permit holders harvest 937,000 pink salmon. Otolith samples recovered from these harvested pink salmon indicated that 100% of the catch was hatchery produced. After July 10, common property seine openings were every other day for 12 hours except for three 36-hour periods at the end of July and early August. Beginning August 25, the district was put on a schedule of two openings per week of 60 hours and 84 hours duration. Purse seine harvest on early pinks peaked with 91 permit holders harvesting 1,487,000 pink salmon on July 16. Purse seine effort in this district peaked on July 20 when 98 permit holders fished. Due to weak early wild stock escapements into Galena and Jack Bays, closed waters for these bays had been increased starting with the first common property fishery opening in July and remained that way for most of the season. VFDA had harvested approximately 98% of their revenue goal by July 25 and ceased selling salmon to their contract buyers. Common property purse seine fisheries starting on July 26 and continuing until August 8 included the western half of Port Valdez. Only a few processors would allow their boats to fish for pink salmon inside Port Valdez at this time because of quality concerns. The Solomon Gulch Hatchery eventually reached 100% of their revenue goal by salvaging the roe from 116,000 excess pink salmon and 5,770 coho salmon during and after their egg-take operations. It is estimated that nearly 14.8 million adult pink salmon were produced by the Solomon Gulch Hatchery in Valdez in 1999. The Eastern District closed on September 17 and did not open again for the season. Over 12.3 million pink salmon and nearly 107,000 chum salmon were harvested by the common property fleet from this district.

Southeastern District

Wild stock pink and chum salmon escapements in some areas of the Southeastern District improved rapidly by the middle of July. Large numbers of pink salmon were observed during aerial surveys traveling along the shoreline in this district. A common property fishery was announced to open concurrently with the Eastern District on July 16. No effort occurred in this area during this open period. Open periods continued concurrently with the Eastern District, but no effort occurred until July 22 when two permit holders fished. Effort increased after this date, peaking on August 6 when 25 permit holders landed approximately 275,000 pink salmon. Otolith samples indicated that nearly 100% of the pink salmon caught in this district were wild stock (Figure 2). Only one delivery occurred from this district after the August 10 opening as processors directed their fleets to fish in other districts where they believed the quality of the fish would be higher. No further harvest occurred after August 16. Over 914,000 pink salmon and 83,000 chum salmon were harvested from this district. This district closed for the season on September 3.

Southwestern District

The initial opening in the Southwestern District on Tuesday, July 27 coincided with the openings in four other districts. The Fish and Game research vessel “Montague” had been recovering otoliths from pink salmon entering the Southwestern District since July 23. The samples indicated that approximately half of the fish entering the district were hatchery produced. Since one vessel could not indicate the volume of fish entering the district, a common property fishery was allowed. The Point Elrington and San Juan Subdistricts and the AFK Hatchery Terminal Harvest Area (THA) were opened. Only seven seine boats fished in the Southwestern District on the first opening harvesting approximately 65,000 pink salmon. Otolith recoveries indicated that 42% of the fish caught were wild stock, 22% were VFDA hatchery fish and 37% were PWSAC produced. The majority of the fleet remained in the Eastern and Southeastern Districts fishing VFDA enhanced stocks and wild stocks. The small effort allowed additional fishing time in the Southwestern District to get a better estimate of the volume of fish entering the district, so another 12 hour period occurred on July 29. A total of 26 permit holders fished in the Southwestern District during the second open period harvesting 157,000 pink salmon. Otolith data collected from the second open period indicated that 58% of the catch was wild stock, 14% was VFDA enhanced stock and 28% was PWSAC enhanced stock. The high percentage of wild stock fish in the harvest, and the increased effort created some concerns over achieving wild stock escapement in the Southwestern District streams. Fishing was halted in the district for three days to allow additional wild stock escapement into the district.

The next 12-hour common property fishing period occurred on August 2. A total of 372,000 pink salmon were harvested by 41 permit holders. Otolith samples collected from this fishing period indicated that 56% of the catch was wild stock, 3% was VFDA enhanced stock and 41% was PWSAC enhanced stock. It was apparent that the proportion of PWSAC produced pink salmon in the catch was starting to increase. Another fishing period occurred on August 4 to establish a trend in volume and stock composition. The catch of 517,000 pink salmon by 40 permit holders indicated that large numbers of fish were beginning to enter the district. Otolith recoveries from this fishing period indicated that the catch contained 29% wild stock, 1% VFDA enhanced stock, and 70% PWSAC enhanced stock. An aerial survey in the Southwestern District on August 2 indicated that wild stock escapements were still less than anticipated, so fishing was again halted for three days after the August 4 period to allow additional wild stock fish into the district.

On August 1, PWSAC started their cost recovery operations in the AFK Hatchery SHA which was four days later than last year. PWSAC’s cost recovery operations were only at 11% of the revenue goal on

August 8 when they were expecting to be at 31%. PWSAC's cost recovery operations were behind the calendar date schedule that had been set pre-season, but the female percentage in their sales harvest indicated that the return was about seven days late in its timing as was the case with the earlier VFDA Hatchery return. The returning pink salmon were also much smaller than last year with an average weight of approximately 2.7 pounds. PWSAC sold about 3.1 million pink salmon in their cost recovery operations at the AFK Hatchery.

The common property fishery resumed on August 8 with just the San Juan and Point Elrington Subdistricts open for 12 hours. The August 10 opening in the Southwestern District included only the Point Elrington Subdistrict which would allow more pink salmon to enter into the AFK Hatchery SHA and THA. An aerial survey on August 9 showed improvement in the escapement in some areas of the Southwestern District. With escapements improving and the peak of the return approaching, additional area was opened on August 12 where escapements were at expected levels for this date. The peak harvest of 1,089,000 pink salmon occurred for this district on the August 12 opening. Otolith samples indicated that this catch was composed of 16% wild stock and 84% of PWSAC hatchery pink salmon. Processor imposed catch limits prevented this catch from going higher, as most fishing vessels had reached their catch limit by early afternoon.

As the season entered into its peak, some processors were unable to supply PWSAC with tenders to purchase their contracted pink salmon. As a result, a buildup of fish began to occur in the THA. Starting with the August 16 fishing period, the AFK Hatchery THA was opened to the common property fleet to prevent a deterioration of fish quality. Peter Pan Seafood's and North Pacific Seafood's last day buying pink salmon from the common property fleet was on August 20. Several other processors quit buying pink salmon in rapid succession at this time, with only two processors buying from the common property seine fleet during the August 26 open period. Large surpluses of pink salmon began building at all of the PWSAC hatcheries as well as many wild stock systems at this time. PWSAC continued to cost recover pink salmon until August 31. One processor returned later in the season and salvaged the salmon roe from some of the surplus fish in the SHA. It is estimated that about 1 million surplus hatchery pink salmon were not harvested at this hatchery. This district closed for the season on September 28 with over 9.5 million pink salmon caught by the common property fleet.

Northern District

The eastern side of the Northern District opened concurrently with the Eastern, Southeastern, and Coghill Districts on July 25. An estimated 6 seiners harvested approximately 23,000 pink and 1,800 chum salmon in this district with a majority of the harvest occurring in the most easterly area where the VFDA enhanced pink salmon were concentrated. Otolith samples indicated that 63% of the harvest from this period was VFDA enhanced pink salmon and 6% was from PWSAC's Cannery Creek Hatchery, the remaining 31% were wild stock. Common property fishing periods occurred every other day after the first open period with the area open being adjusted to target the returning hatchery pink salmon from the Solomon Gulch Hatchery or PWSAC's Cannery Creek Hatchery. By July 31, the pink salmon catch was composed of 56% PWSAC enhanced fish, 8% of VFDA enhanced fish and 36% wild stock. Fishing effort was now concentrated around Payday Point at the entrance of Unakwik Inlet, where the Cannery Creek Hatchery is located. PWSAC began their cost recovery operations on August 4 at the Cannery Creek Hatchery which was about one week later than last year. On August 8, the area open to fishing was changed to include the central portion of the district, including approximately half of Unakwik Inlet to target fishing effort on the PWSAC pink salmon return to Cannery Creek Hatchery and to shift effort from hatchery coho stocks entering Port Valdez. On August 11, PWSAC decided that they would do most of their cost recovery at the

WHN and AFK Hatcheries and to allow the common property fishermen to harvest the majority of the Cannery Creek pink salmon return. The open waters in the Northern District were changed on August 12 to allow fishing in Unakwik Inlet up to the hatchery THA to harvest surplus hatchery pink salmon. The peak harvest occurred on August 12 when 50 permit holders landed 734,000 pink salmon. The stock composition of this harvest was 93% PWSAC enhanced and 7% wild stock pink salmon.

The Perry Island Subdistrict of the Northern District was opened on August 10 to the common property fleet. Pink salmon were starting to arrive at the WHN Hatchery in the Coghill District in large numbers, but many had not entered the THA or SHA where they could be harvested by the cost recovery fleet. In order to slow down the numbers of fish entering the Esther Subdistrict without jeopardizing the cost recovery operation at the WHN Hatchery, the Perry Island Subdistrict was opened, but the Esther Subdistrict remained closed. This strategy had the desired effect of slowing the run entry into the WHN Hatchery. The use of this strategy is hampered by the PWS Management and Salmon Allocation Plan (d)(3)(C) which states that the Perry Island Subdistrict shall be closed when the Esther Subdistrict is closed to achieve corporate escapement goals and broodstock needs. The Esther Subdistrict did open on August 14. In years of very large returns, opening the Perry Island Subdistrict at times when the Esther Subdistrict is closed allows the harvest of pink salmon milling in the area which improves the quality of the harvest further into the season in the northern areas, especially around the WHN Hatchery.

PWSAC continued cost recovery operations on a smaller than normal scale at the Cannery Creek Hatchery harvesting about 2.1 million pink salmon. The average weight of these salmon was about 2.8 pounds. As with the other hatcheries, the female percentage in the cost recovery harvest was quite low initially, indicating that the pink salmon were seven to eight days late in their return timing. PWSAC finished their cost recovery harvesting on August 30. Waters of the Cannery Creek Hatchery THA and SHA were opened to the common property fleet on Sept. 2. Over 600,000 pink salmon were harvested by the common property fleet from the Cannery Creek Hatchery SHA and THA after that date. It is estimated that 1million surplus hatchery pink salmon were not harvested this season. This district closed for the season on September 28 with over 4.9 million pink salmon harvested by the common property seine fleet.

Montague District

Pink salmon escapements in the Montague District improved rapidly by August 1. A 12-hour fishing period occurred on August 4 which opened concurrently with the Coghill, Eastern, Northern, Southeastern, and Southwestern Districts. The peak harvest occurred on August 4 when nine permit holders delivered 118,000 pink salmon. Deliveries were made on the August 6 open period, but no further catch occurred after that period even though the district was open every other day and stream escapements were far above the goals set for that district. Very little effort occurred in this district since all of the processors had placed their fishermen on daily catch limits which were more easily obtained in areas where hatchery pink salmon were available. The Montague District closed to salmon fishing for the 1999 season on September 3 with over 189,000 pink salmon and 638,000 chum salmon harvested.

Coghill District

The Coghill District became a dual gear area on July 21, allowing purse seiners access to enhanced pink salmon returning to WHN Hatchery and wild pink salmon returning to the district's streams. This season's sockeye salmon return to Coghill River was strong and met its spawning escapement goal on July 4. Pink salmon were also entering the Coghill River in large numbers. The strength of the wild salmon returns allowed the district to be managed more aggressively. The Coghill District, including the waters of the

WHN Hatchery SHA and THA were opened to gillnet fishing through the evening of July 20. The district opened to purse seine gear at 12:01 a.m. on July 21, except that Bettles, Hummer and Pigot Bays remained closed to protect wild stock escapements. The Esther Subdistrict, including the waters of the WHN Hatchery SHA and THA, were opened to the common property fishery on an every other day schedule until July 29 at which time the Esther Subdistrict was closed to allow for corporate escapement. Some portions of the Coghill District continued to be opened for 12 hours on an every other day schedule with one 36 hour period occurring on July 29 and three additional 36-hour periods beginning on August 4 and ending on August 9. These open periods were allowed in order to harvest the surplus Coghill River wild stock pink salmon. Even though the district was open, very little effort occurred on the Coghill River wild stocks as the fleet was distributed in other districts where larger hatchery and wild stock returns could be found. Indeed the boats that were fishing in the Coghill district were concentrated along the boundary of the Esther Subdistrict where they could intercept hatchery bound pink salmon. Over 155,000 pink salmon passed through the Coghill River weir which is located about one mile upriver. The Esther Subdistrict reopened on August 14 to the common property fishery. The peak harvest and effort occurred on August 16 when 26 permit holders landed 525,000 pink salmon. Otolith recoveries from this harvest indicated that 98% of the pink salmon caught were PWSAC produced, the remaining 2% were wild stock.

PWSAC started their cost recovery operation at the WHN Hatchery on July 31 which was 10 days later than last year. As with the other hatcheries, the female percentages in their catch were quite low at the beginning of their cost recovery harvest, indicating that the run was about 10 days late in its arrival. The WHN Hatchery made the highest contribution to PWSAC's cost recovery operations with 3.8 million fish harvested. The average weight of these cost recovery fish was 2.8 pounds. The common property fleet was allowed back into the hatchery SHA on August 26. The cost recovery harvest at the WHN Hatchery was completed on August 27. Approximately 984,000 pink salmon were harvested by the common property fleet after the SHA was reopened. It is estimated that 500,000 pink salmon remained at this hatchery after all fishing ceased. This district closed on September 28 with over 3.5 million pink and 1.3 million chum salmon harvested by the common property purse seine and gillnet fleets.

Coho Salmon, Eastern District

Starting on August 8, Port Valdez was closed to protect the coho salmon return to Solomon Gulch Hatchery and to provide reasonable separation between the sport and commercial harvesters targeting the enhanced coho return. A total of 68,250 coho salmon were caught by seiners in the Eastern District in 1999. A 60-hour opening in Port Valdez following the Labor Day weekend resulted in a harvest of 39,232 coho salmon by 11 permit holders. The Eastern District closed on September 17 with no additional open periods, as no harvest had been reported in the previous period and all the processors had ceased buying coho salmon in Port Valdez.

Coho Salmon, Coghill District

The coho return to the WHN Hatchery was much smaller than forecast. This hatchery did not have enough coho return to the facility to meet their broodstock needs. Catch information from fish tickets did not indicate that the hatchery produced coho salmon were intercepted during the pink salmon fishery. Less than 1,500 coho salmon were taken in the common property fishery in the Coghill District and approximately 500 coho salmon were captured as broodstock. The return was only about 13% of the forecast. The coho returns to this hatchery have been trending down for the past several seasons as fewer coho have been released. Recent hatchery remodeling resulted in a change to the coho salmon rearing program. Previously, coho salmon fingerlings were reared in a poor quality pond, now rearing occurs in a

more efficient and sanitary raceway system. As a result, the total rearing capacity was reduced. Additional changes to the program may be needed if it is to continue.

Conclusions and Recommendations

The department is currently working with fishing industry representatives to explore management options that can maximize utilization of the pink salmon resource while providing for corporate and wild stock escapement needs. After accounting for the wild stock escapement index, hatchery broodstock, and post season surpluses that were not harvested, 1999's total return estimate for pink salmon is approximately 51.5 million fish. Despite this being the largest pink salmon harvest in PWS history, the significant unused surplus of pink salmon clearly indicates that changes and improvements are needed before the PWS area can successfully experience another pink salmon return of this magnitude. The necessity of limiting harvests to match processing capacity during the peak of the return points to a potentially serious shortage of processing capacity for the PWS purse seine fleet. During years with large harvests statewide, pink salmon harvests in other regions clearly can have an influence on the conduct of the pink salmon fishery in PWS. PWS pink salmon have sometimes been exported to Kodiak or Southeast for processing. Fortunately, the lateness of the pink salmon return to the Kodiak Island area provided a window of opportunity for some companies to export pink salmon out of PWS for processing. One processor did import pink salmon from Southeast Alaska into PWS after they quit buying from the PWS fleet. In 1998, the opposite scenario occurred and pink salmon were imported into PWS from Kodiak for processing. Both years had a surplus of pink salmon remaining in PWS when the salmon fishery ended. With strong returns statewide this year, processors ended operations in PWS early citing quality concerns and the lack of tin for canning as the main reasons. It is estimated that over 2 million of the surplus enhanced hatchery produced pink salmon were harvested for their roe by a few processors with the ability to dispose of the carcasses, but an estimated 2.8 million surplus enhanced fish were not harvested. In addition, the surplus escapement in the wild stock systems could also have been harvested if the capacity to process these fish was available.

In addition to recognizing the need for additional processing capacity in PWS, the department hopes to improve pink salmon utilization by broadening its ability to use otolith marks for improved forecasting and inseason management. With otolith marked fish, the risks to wild stocks associated with a harvest decision can be evaluated prior to a fishery being announced. Post fishery analysis can be used to further refine management. Stream escapements, commercial harvests, and migration routes can all be accurately characterized using otolith marks. As a management tool, otolith marks offer a great deal of useful information about wild and hatchery pink salmon interactions. Figure 7 provides the sound wide pink salmon contribution to the commercial catch based on otolith thermal marks.

Reliably forecasting the magnitude of the PWS return can assist local managers, hatchery operators and the fishing industry in sufficiently preparing for the coming salmon season. The commercial harvest of 45.0 million pink salmon in 1999 exceeded the forecasted harvest by 15.0 million fish. Major processors cited quality and a lack of tin as their reason for ceasing operations near the peak of the late pink return. Reliable statewide forecasts can help the entire industry identify and address where and if regional processing shortfalls are likely to occur. Traditional markets and outlets may be unwilling or unable to absorb consistent annual harvests of 100 million pink salmon from Alaska. Until this issue is addressed locally and statewide, post season surpluses comprised of late timed pink salmon are likely to result.

Subsistence and personal use harvests continue to be minor by comparison to the commercial salmon harvest in the Prince William Sound management area. The largest subsistence and personal use fisheries occur on the upper Copper River, upstream of the regulatory markers above Haley Creek to the Copper River's confluence with the Slana River. In Prince William Sound and the Copper and Bering River Districts, commercial fishermen may withhold a portion of their commercial catch for home use. Since 1994, all chinook salmon in the Copper and Bering River Districts that are harvested, but not sold, in the commercial fishery (home use) must be reported on a fish ticket.

The area's only personal use fishery occurs on the upper Copper River in the Chitina Subdistrict. All remaining waters of the Prince William Sound Management area are closed to the personal use taking of finfish. Subsistence fishing permits are issued from the Cordova office for the Copper River Delta and designated waters of Prince William Sound.

Copper River District Subsistence Fishery

The boundary lines for the Copper River District are the same as the commercial gillnet fishery. Subsistence fishing is only allowed during commercial gillnet periods. Within the Copper River District, gill nets are the only legal gear and may have a maximum length of 50 fathoms with a maximum mesh size of 6 inches prior to July 1. In addition to the subsistence fishery, commercial fishermen may withhold a portion of their commercial catch for home-pack. However, any commercially caught chinook salmon not sold must be reported on a fish ticket as home-pack. During the 1996-1999 seasons, an average of 1,487 chinook salmon have been listed in this category.

In the Copper River District, the average number of permits issued from 1991 through 1995 was 117, with an average annual harvest of 827 salmon. For the years 1996-1999, an average of 247 subsistence permits have been issued for the Copper River District. In 1999, 294 permits were issued and this season's harvest set records for both king and sockeye salmon. A harvest of 353 kings and 1,330 sockeye salmon were reported. A total of 102 of the 274 permit holders reported they did not fish.

Between 1994 and 1996, as many as five permits have been issued for the Batzulnetas subsistence fishery. In 1997, there were no permits issued. In 1998, one fishwheel permit was issued. In 1999, the U.S. District Court issued a preliminary injunction against the State of Alaska from enforcing 5AAC 01.647(i)(5) which established fishing periods through emergency order authority. The injunction allowed subsistence fishing 7 days per week from June 1 through September 1 or until 1,000 sockeye salmon were taken. No more than 250 sockeye salmon could be taken in any one week.

Eastern and Southwestern District Subsistence Fisheries

The Southwestern and Eastern subsistence area's permit program began in 1988. Residents of both Chenega Bay and Tatitlek are eligible for subsistence use permits in their respective areas. In 1991, a court ruling qualified all residents of Alaska for a subsistence permit in the Eastern or Southwestern areas. Permit holders are allowed to fish in these areas from May 15 until two days before the first commercial fishing period. Once the commercial fishing season is established, subsistence fishing may occur only during commercial fishing periods. Two days after the closure of the commercial fishery for the season, subsistence harvesting is open to seven day per week fishing until September 30 in the Southwestern area and until October 31 in the Eastern area.

In 1999, 17 permits were issued for the Eastern District and 8 permit holders reported fishing, catching a total of 344 sockeye, 541 coho, 31 pink, and 31 chum salmon. In the Southwestern District, fourteen permits were issued and 7 permit holders reported catching 57 chinook, 499 sockeye, 62 coho, 168 pink and 101 chum salmon.

1999 UPPER COPPER RIVER SUBSISTENCE AND PERSONAL USE FISHERIES

Subsistence Fishery

The Upper Copper River District opens June 1 through September 30 for continuous fishing in all waters of the mainstem Copper River upstream of the Chitina-McCarthy bridge to the mouth of the Slana River. During the 1996 Board of Fisheries meeting, the Copper River District Salmon Fishery Management Plan was modified and established a range of 60,000 – 75,000 subsistence salmon to accommodate the variability in harvest levels and allow for increased harvests between board cycles. Fish wheels and dip nets are legal gear. Participants are allowed one permit per household and the permit identifies the gear type to be used. The total annual harvest limit cannot exceed 500 salmon for a household of two or more and 200 for a household of one. No more than 5 chinook salmon may be taken by each dip net permit holder. The caudal fin must be clipped from all salmon that are harvested.

Between 1994 and 1998, an average of 717 fish wheel and 247 dip net permits were issued). The subsistence harvest has been increasing steadily since 1988 and a record number of nearly 70,000 salmon were harvested in 1994). Sockeye salmon dominate the harvest followed by chinook and coho salmon).

For the years 1991 to 1995 in the Upper Copper River District, an average of 793 dip net and fish wheel permits were issued annually. The average total harvest was approximately 53,000 salmon. For the years 1996 through 1998, an average of 998 permits were issued and the average reported harvest was 64,755 salmon. Subsistence permits with completed harvest information are required to be returned to the department by October 31 of each year. As of March 1, 2000 over 90% of the upper Copper River subsistence permits had been received at the Cordova ADF&G office. Additional reports continue to be received and, as a result, this report contains preliminary upper Copper River Subsistence data for 1999. The 1999 data will be updated and finalized in the 2000 AMR.

The 1997 chinook subsistence harvest was the previous peak harvest when 2,439 chinook were reported taken. From permits returned through March 1, 2000, 3,058 chinook have been reported as being taken for subsistence in 1999. From the permits received, approximately 25% of the chinook salmon subsistence harvest was landed by 2% of the permit holders, indicating that some individuals effectively target chinook salmon for subsistence uses. The reported 1999 sockeye salmon subsistence harvest (as of March 1, 2000) is 72,901 reds, short of the record reported harvest of 78,188 sockeye salmon in 1997.

Batzulnetas Subsistence Fishery

In 1987, an interim subsistence fishery was provided for by emergency regulation at Batzulnetas to settle the United States District Court case of John vs. Alaska. The Batzulnetas fishery encompasses all waters from the regulatory markers near the mouth of Tanada Creek and approximately one-half mile downstream from that mouth and in Tanada Creek between ADF&G regulatory markers identifying the open waters of the creek. The fishery may begin after June 1. Fishing periods during the month of June are one 48-hour

period per week. Beginning in July fishing periods are 84-hours per week until September 1 when the fishery closes.

In 1987, the fishery was conducted near the mouth of Tanada Creek near the historical village site of Batzulnetas. Eight permits were issued in that year to individuals or family groups from Mentasta and Dot Lake, and the fishery was conducted during July and early August. A total harvest of 22 sockeye salmon was reported in 1987. The Board of Fisheries reviewed the fishery before the 1988 season and set seasons, eliminated the quota, and provided for additional gear types. Permits can be issued throughout the season and must be completed and returned to Fish and Game by September 30. No permits were issued for this fishery between 1988 and 1992. However, in 1993, one permit was issued and the permit holder harvested 160 sockeye salmon. In 1994, five permits harvested 997 sockeye. In 1995 four permits were issued, and 16 sockeye were harvested. No permits were issued in 1996. In 1997, three permits were issued. One household reported fishing and having harvested 176 sockeye salmon. In 1998, one permit was issued and a harvest of 386 sockeye salmon was reported. In 1999, one permit was issued with a reported harvest of 55 sockeye salmon.

Personal Use Fishery

In 1999, the personal use fishery was opened by emergency order on June 11 for a 36-hour fishing period. The Copper River Personal Use Salmon Management Plan requires the fishery to be opened between June 1 and June 11. Due to low salmon numbers the second period beginning June 19 was also a 36-hour fishing period. The third period (June 23-27) was reduced to 104-hours, based upon actual sonar counts. Beginning June 11, actual counts past the Miles Lake sonar were double the projected counts and, in response to the weekly escapement objectives being met, the personal use fishery opened to continuous fishing on June 30. During the week of June 21 – 27, an excess of 50,000 salmon passed the Miles Lake sonar and resulted in a supplemental permit issued in the fishery the week of July 12 – 18 (an additional week of migration time was allowed due to higher water levels). Ninety-seven supplemental permits were issued during the week resulting in a harvest of 780 additional sockeye salmon. Harvests exceeded the weekly allocation seven of the first eight weeks of the fishing season, but only during the second and seventh weeks did the harvest exceed the available surplus. The reported harvest for the personal use fishery in 1999 was 5,755 chinook, 137,729 sockeye and 2,095 coho salmon. There were 9,943 dip net permits issued in 1999 (Appendix G.5.)

GULKANA HATCHERY

The Gulkana Hatchery is located on the Gulkana River approximately 6 miles north of Paxson Lake. The hatchery was built in 1973 and was operated by the Department of Fish and Game, Division of Commercial Fisheries. In 1992, the hatchery was transferred to Prince William Sound Aquaculture Association. The donor stock for the facility was the local wild stocks at the hatchery site on the Gulkana River. The Gulkana Hatchery was expanded to two facilities in 1986. The Gulkana I facility has grown from a 225,000 egg capacity in 1973, to a 35.5 million egg capacity in 1995 which generates an annual adult return of as many as 800,000 adults. The Gulkana II facility has a permitted capacity of 2.5 million eggs.

The hatchery produces sockeye salmon for the common property fisheries, which include commercial, personal use, subsistence, and sport fisheries. In addition to the common property harvest, hatchery returns meet brood stock needs and also create an additional surplus of sockeye salmon at the hatchery and the Crosswind Lake remote release site. Since the run timing of hatchery stocks coincides with that of delta

wild stocks, the harvest rate in the commercial fishery is determined by the strength of the wild stock escapement. Enhanced returns are therefore harvested at the rate that can be sustained by wild stocks. This is generally expected to be between 50% and 60%. This wild stock priority creates surpluses of enhanced sockeye salmon when hatchery returns are large and wild stocks are weak or less plentiful. These unharvested enhanced returns are designated as the hatchery surplus component of the inriver escapement goal in the Copper River District Salmon Management Plan. For planning purposes, the department annually estimates the hatchery surplus in the preseason forecast but the actual surplus will depend upon the actual run strength of the wild and enhanced stocks. Recently, because of increased survivals of sockeye released in Crosswind Lake, the forecasted hatchery surplus has ranged from 58,600 fish in 1997 to 220,000 fish in 1999. Gulkana Hatchery stocks are intermixed with other sockeye stocks and other salmon species to the extent that no targeted harvest can occur within the commercial fishery or mainstream in-river fisheries

Gulkana hatchery brood stock needs are estimated annually and are also included in the Copper River inriver escapement goal. Adequate fish should be available for brood stock needs Gulkana Hatchery if the Copper River inriver escapement goal is attained at the Miles Lake sonar.

Historically, the Gulkana Hatchery operator has harvested only brood fish. Under ADF&G management, hatcheries were operated through general fund appropriations. Since PWSAC has operated the Gulkana facility only brood stock was harvested until 1997. Primarily, facility operating and capital costs have been met through a 2% fishermen's assessment and through corporate revenues from the sale of Wally Noerenberg Hatchery and Main Bay Hatchery salmon. In an effort to avoid excess fish entering Crosswind Lake, a Special Harvest Area (SHA) has been designated to allow the hatchery operator the opportunity to harvest returning adults. PWSAC has established a cooperative program with a local contractor to harvest the returning Crosswind Lake adult sockeye and process them for market. PWSAC receives certain financial benefits from the sale of these fish to the contractor. No directed management is required to meet the adult return objectives at Crosswind Lake; the fish that are harvested for sale are considered cost recovery fish.

The Crosswind Lake Special Harvest Area (SHA) consists of the waters of Dog Creek west of approximately 145°52.83' W. Long. downstream to a weir located at approximately 62°34.70' N. Lat., 145°53.7' W. Long. (NAD 1983). PWSAC is allowed to construct a weir or series of weirs to conduct a cost recovery harvest. Seines or dip nets may be used to harvest cost recovery fish in the SHA. PWSAC, or its contractor, harvests sockeye salmon during periods established by emergency order. All other species must be allowed free upstream or downstream passage. In order to provide state residents with the opportunity to use excess production from Crosswind Lake, PWSAC, or its contractor, may at their discretion, give away up to 30 sockeye per household to residents who come to the site and request the fish. Between 1997 and 1999, an average of 31,891 sockeye salmon have been harvested and sold from the Crosswind Lake SHA. Following a return of some 20,000 sockeye in 1995, the return in 1996 jumped to 99,000 sockeye salmon. Between 1996 and 1999, the total return to Crosswind Lake has averaged 82,986 sockeye salmon.

When PWSAC is unable to harvest the surplus hatchery sockeye in the SHA, they will, under authority of the ADF&G, destroy all sockeye salmon in excess of escapement needs. Disposal of these fish is undesirable, however, allowing them to escape into Crosswind Lake is also problematic. At public meeting conducted by PWSAC during the winter of 1995/96, Crosswind Lake area landowners indicated that the increased escapements of recent years was unacceptable and that it would create a public nuisance if large numbers of fish are allowed into the lake.

The intent for developing this SHA is to limit the return of surplus enhanced sockeye salmon into Crosswind Lake, provide local economic opportunity, and provide state residents with a source of salmon. There is negligible spawning habitat at Crosswind Lake and no natural production escapement goal has been established. This SHA will prevent most of the returning sockeye salmon from migrating into the system while providing benefits to both PWSAC and state residents.

The Department of Fish and Game is currently working with Prince William Sound Aquaculture Corporation to create a Basic Management Plan for Gulkana Hatchery that will revise current release numbers and release strategies so that the size of the hatchery's adult returns will be within the ability of the department to manage the mixed stock fishery for sustained yield of wild stocks. The desired result is a reduction of the annual hatchery surplus that has grown significantly larger in recent years while achieving wild stock escapement goals. In addition, mass marking of enhanced stocks will likely occur in the spring of 2000 as part of the cooperative effort between the department and PWSAC. The ability to accurately estimate the enhanced sockeye salmon contributions to the various fisheries in the Copper River will further support the department's efforts to manage for the wild stock priority while efficiently utilizing the enhanced sockeye salmon component of the return.

1999 PRINCE WILLIAM SOUND HERRING FISHERIES

Preseason Outlook and Harvest Strategy

The Prince William Sound herring management area encompasses all coastal waters of the Gulf of Alaska between Cape Suckling and Cape Fairfield, extending offshore to 59° N. latitude. Five herring fisheries occur during the year.

During the spring season, two fisheries target herring for sac roe using either seine or gillnet gear. Two spawn-on-kelp fisheries harvest either naturally occurring spawn on kelp or spawn on kelp suspended in pounds. In the fall, a food-and-bait fishery occurs. Of the five herring fisheries, only the wild spawn-on-kelp and the food-and-bait fishery are open entry fisheries.

During the December 99 BOF meeting several regulatory changes to PWS herring fisheries took place. Two of the new regulations could affect all five herring fisheries. New regulations were created that will standardized PWS buyer, buyer's agent, or fisherman's fish ticket reporting requirements with those in other parts of the state and closed Tatitlek Narrows to all commercial herring fishing. The BOF also created new regulations that would increase the legal depth of a purse seine used in the fall food/bait fishery and specified herring spawn-on-kelp pound marking requirements.

For management purposes, all herring fisheries target on what is treated as a single major stock of herring that spawns during the mid-April to early May period. At the 1994 BOF meeting in Cordova, the minimum spawning biomass threshold was raised from 8,400 to 22,000 tons for the PWS stock. No fishery may be opened if the estimated spawning biomass is below this level. The 22,000 ton threshold is 25 % of the potential spawning biomass from an unfished stock. The higher threshold will establish manageable harvest levels while reducing the risk of driving the population to low abundance through overfishing. When the stock size is between 22,000 and 42,500 tons, the PWS Herring Management Plan (5 AAC 27.365) allocates the projected available surplus to the five fisheries based on a 0 to 20 % harvest rate. The maximum harvest rate of 20 % is applied when stock size is greater than 42,500 tons. The sac roe seine fishery is allocated 58.1 % of the available surplus; the food-and-bait fishery 16.3 %; the pound spawn-on-

kelp fishery 14.2 %; the wild spawn-on-kelp fishery 8.0 %; and the gillnet sac roe fishery is allocated 3.4 %. The 1999 spawning biomass was projected to be 39,557 tons and dominated by age-3 fish (1996 year class), age-4 fish (1995 year class), and age-5 (1994 age class). With the spawning biomass approaching the upper threshold of 42,500 tons, the exploitation rate was set at 15%. Fishery allocations were 3,447 tons for the sac roe seine fleet, 202 tons for the gillnet sac roe fleet, 843 tons of herring were allocated to the pound fishery, and 475 tons were allocated to the wild spawn on kelp fishery.

As only the pound fishery took place this year, the 1999 spring herring fisheries utilized approximately 49 tons of herring out of the 5,934 tons allocated to the four fisheries. Total value of the pound fishery was determined to be approximately \$98,456.

There are 104 permanent and 2 interim purse seine permits in Prince William Sound. Purse seines can be 150 fathoms in length and 1000 meshes deep. Mesh size is not regulated. There are 24 gillnet permits in Prince William Sound. Gillnets are limited to 100 fathoms in aggregate length and 120 meshes in depth. Mesh size is regulated from a minimum of 2 1/8 inches to a maximum of 3 inches. Historic sac roe harvest is presented in Appendix H.4 The wild spawn-on-kelp fishery, utilizing native Prince William Sound kelp, occurs after a major spawning event takes place on marketable species of kelp. Wild kelp is taken by divers or by hand picking depending on the type of kelp available for harvest and market demand. The historic wild spawn-on-kelp fishery harvest is given in Appendix H.6. There are 128 herring pound permits in Prince William Sound. Seine specifications for the closed pound fishery are the same as the sac roe seine fishery. Open and closed pound fisheries can be managed separately or in combination. The size of the pound is limited to 2,000 square feet at the surface and walls of a closed pound cannot exceed 30 feet in depth. The herring allocation for this fishery is divided among the number of permit holders and the department establishes the maximum number of blades of kelp a permit may maintain in the pound. The historic pound spawn-on-kelp fishery is given in Appendix H.7. The food/bait fishery season may run from October 1 through January 31; however, industry concerns over product quality usually results in a delay of the season's opening date until November. Purse seine size is not restricted for the food/bait fishery and trawling or gillnetting may also occur. The historic food/bait fishery harvest is given in Appendix H.9. Historic fishery harvest values for all Prince William Sound fisheries are presented in Appendix H.13.

1999 Season Summary

During late March, the department, along with the Prince William Sound Science Center, conducted herring surveys using Biosonics hydroacoustic gear. The surveys covered Montague Island (Zaikof Bay, Rocky Bay, Stockdale Harbor, Green Island and Port Chalmers) and, to a lesser extent, the areas in eastern PWS (Sheep Bay to Port Fidalgo). Preliminary estimates were that between 1,000 and 5,000 tons of herring were in the surveyed areas of eastern PWS. At Montague Island, survey estimates were that between 11,000 and 19,000 tons of herring were residing in Zaikof Bay. For the past few years, greater numbers of herring have been seen overwintering in both Zaikof Bay and Rock Bay, as well as in waters around Green Island. In stark contrast, during the spring 1999 survey very few herring were located outside of Zaikof Bay. The department's inability to detect any significant biomass of herring outside of Zaikof Bay was both unusual and troubling.

In general, spring sampling in recent years has indicated that a significant portion of the herring biomass residing in Zaikof Bay were juvenile, pre-recruit herring and that older age classes of herring were commonly found in the Rocky Bay and Green Island areas. Sampling for size and age composition (AWL) was conducted in conjunction with the hydroacoustic survey and the first AWL data from Zaikof Bay provided additional troubling results. In late March, herring sampled from Zaikof Bay had an average

weight of 132 grams and the predominant age classes were age-4 (26%) and age-5 (32%). Based on past years sampling in Zaikof Bay, the expectation was that a higher percentage of age-3 herring would be found in the AWL sample. The Zaikof Bay sample was less than 2% age-3 fish. While the sample did indicate that marketable sized herring were available, the preseason forecast had anticipated that, in numbers of fish, age-3 and age-4 herring would comprise 73% of the spring spawning population. The lack of age-3 fish in the Zaikof Bay samples was a troubling anomaly. In addition, age-4 herring were expected to be more numerous than age-5 herring whereas, in actuality, the opposite trend was indicated. This sample and subsequent AWL samples from the Montague Island area were indicating that few recruit aged fish were present in the area. The department's preseason expectation was that, because of numerous recruit aged fish, it might be difficult to locate discreet concentrations of marketable sized fish that would meet the processing industry's minimum standards. Once daily sampling commenced to assess roe maturity and average size, very few samples were collected that were below minimum size standards set by the industry.

Aerial surveys to monitor abundance, distribution and spawning activity began on March 25 and continued throughout the month of April. In eastern PWS, 14.7 miles of spawn were observed between March 25 and April 20. The peak shoreline miles of spawn were observed during the first survey of the season on March 25. As in most years, the first spawn in PWS was seen around the St. Mathews Bay and the Hells Hole area. April spawning events in other areas of eastern PWS can be characterized as light and intermittent. The peak survey counts in the Montague Island area occurred on April 15 with a large prespawning biomass of approximately 5,500 tons observed along the shoreline, predominantly in Rocky Bay. Peak spawning was observed at Montague Island from on April 16-19. Overall, the shoreline mile/days of spawn were significantly less than in previous seasons. A total of 6.1 miles of spawn were documented on Montague Island in 1999 as compared to 16 miles in 1998. A majority of the spawning activity in the Montague Island areas occurred from April 16 through April 22 versus a much broader timing window of April 5 to April 22 in 1998.

An aerial survey on April 9 did not observe any herring around the Montague Island area and Zaikof Bay was the only location where marine mammals and sea birds were congregating. The marine mammal activity indicated that the herring biomass detected there during the hydroacoustic survey was still present. A test set was made at Zaikof Bay on Sunday, April 11 over the large biomass at the head of the bay. The average sizes from two samples were 143 grams and 147 grams. Roe maturity was measured at 6.6% mature and 3.7% immature from the first sample and 6.5% mature and 1.8% immature roe for the second sample. The Research Vessel Montague departed Cordova for the Montague Island area on Monday, April 12. As is tradition, the sac roe seine and gillnet fisheries had been placed on 48-hour advance notice on April 1. With the departure of the R/V Montague, advance notice for the sac roe seine fishery was reduced to 24 hours on April 12. If a fishery were likely, advance notice would have been shortened further. Advanced notice of 12 hours or more gave time for vessels and tenders still in area ports to reach the fishing grounds. During an aerial survey on April 12, approximately 250 tons of herring were observed in Stockdale Harbor. This was the first herring observation at Montague Island of any significance outside the Zaikof Bay area.

On April 14 the department announced that advanced notice for the sac roe seine fishery was being reduced from 24 hours to 12 hours the following day. The high tide series for April would begin later in the week. Peak tides would likely be a factor in the timing of a spawning event and, if the herring biomass suddenly improved, the shorter notice would allow the department to react more quickly. Concurrent with the reduced advance notice, the department announced its intention to proceed cautiously in regards to conducting a sac roe harvest. Daily roe maturity and age composition sampling would continue but there

was no clear indication that the biomass at Montague Island was even close to matching the preseason expectations. A roe maturity sample from Stockdale Harbor on April 14 showed 8.3% mature roe and 3.3% immature roe with an average gram size of 131 grams. There were 35 males, 25 females and 3 spawnouts in the sample. An age composition sample collected in Zaikof Bay on Sunday, April 11 contained 202 fish: 125 males and 77 females. The average weight was 136 grams with an average length of 216 mm. Age-3 fish comprised 1.5% of the sample, age-4 fish comprised 27.2%, and age-5 fish comprised 35.6% of the sample. To date, all herring samples from Montague Island had been comprised of less than 2% age-3 fish. Age-4 and age-5 herring were the predominant age classes in the samples however; there were significantly less age-4 herring than expected. The 1999 forecast indicated that age-4 herring would comprise roughly 50% of the spawning biomass. Higher than anticipated mortality in that age class over the preceding 12 months would greatly reduce the spawning biomass population in PWS.

An aerial survey on April 15 noted an increase in the herring biomass in Rocky Bay. It appeared that the prespawning herring that had been maturing in Zaikof Bay had spilled out of Zaikof Bay and entered Rocky Bay. The average size of Zaikof Bay herring had consistently been between 130 and 150 grams and the current AWL samples of Rocky Bay herring were consistent with the age composition of herring seen earlier in Zaikof Bay. An age composition sample collected in Rocky Bay on Thursday, April 15 consisted of 443 fish: 257 males and 184 females. The average weight was 143 grams with an average length of 218 mm. Age-3 fish comprised less than 1% of the sample, age-4 comprised 27%, age-5 comprised 32%, age-6 comprised 4%, and age-7 and above comprised 4% of the sample. Marine mammal and bird activity increased inside Rocky Bay and decreased in Zaikof Bay. Several roe maturity samples from Rocky Bay were also collected on April 15. Pooled sample results showed 9.2% mature roe and 1.1% immature roe with an average gram size of 135 grams. There were 76 males, 62 females, 10 immature and 0 spawn outs in the sample. A second sample showed 11.3% mature roe and 1.6% immature roe with an average gram size of 141 grams. There were 71 males, 34 females, 65 immature and 1 spawn out in the sample. An additional roe sample from Rocky Bay showed 8.3% mature roe, 0.8% immature roe with an average gram of 139 grams. There were 39 males, 29 females, 4 immature and 0 spawn outs.

By late in the evening of April 15, a majority of the biomass appeared to have exited Rocky Bay and moved toward Stockdale Harbor and Port Chalmers. To assess the remaining herring biomass in Zaikof Bay, the department conducted a hydroacoustic survey in Zaikof Bay on the evening of April 15. Preliminary estimates indicated that less than 1000 tons of herring remained in Zaikof Bay. Sampling indicated that the remaining fish were predominately juveniles. In some samples, the average size had dropped to 65 grams. Several roe maturity samples were collected from Zaikof Bay on April 16. The first sample showed 1.8% mature roe and 3.6% immature roe, with an average weight of 104 grams. There were 44 males, 7 mature females, 30 immature females, 10 spawn outs and 5 juveniles. The second sample showed 2.6% mature roe, 3.0% immature roe, with an average weight of 102 grams. There were 52 males, 8 mature females, 24 immature females, 4 spawn outs and 10 juveniles. The third sample showed 1.4% mature roe, 3.6% immature roe, with an average weight of 114 grams. There were 37 males, 6 mature females, 28 immature females, 8 spawn outs and 9 juveniles. From the roe maturity samples and the hydroacoustic survey, it appeared that the spawning biomass had departed Zaikof Bay a few days earlier leaving immature and juvenile fish.

The solitary herring biomass that had been in Zaikof Bay appeared to be the only significant aggregation of herring that was contributing to the spawning population in the Montague Island area. Aerial surveys and AWL samples in the Port Chalmers and Stockdale Harbor areas indicated that those herring were the same fish that has exited Zaikof Bay two day earlier. Approximately one mile of spawn had been observed near Montague Pt. on April 16 and 17. The department announced on April 17 that it would continue to assess

the Montague Island area for any improvements in the herring biomass but, unless a marked improvement was noted in the biomass and age structure of the herring population, a sac roe fishery was unlikely to occur. The sac roe seine fleet remained on 12-hour advance notice. The sac roe gillnet fleet remained on 48-hour advanced notice.

Spawning continued on April 17 at the reef near Montague Point. The department conducted a three-hour sonar survey near Green Island and Port Chalmers but did not detect any significant schools of herring. During an aerial survey the same day, approximately 2,000 tons of herring were observed between Montague Point and Graveyard Point. Over the next 48 hours, there was no improvement in the observed biomass in the Montague Island area. With spawning activity well underway near Montague Point and in scattered areas of Stockdale Harbor, the decision was made to cancel both sac roe fisheries effective 12:00 noon on Tuesday, April 20. Because the closed pound fishery was already underway, permit holders who had introduced herring into closed pounds had until Sunday, April 25 to release herring. All pounded kelp was, by regulation, required to be removed from the water at that time.

Spawn-On-Kelp In Pounds Fishery

PWS herring pound permit holders were given the option preseason of choosing to operate an open pound with a kelp quota of 680 blades or a closed pound with a kelp quota of 435 blades. Open pounds would be allowed to fish in the Montague Island area, where a majority of the PWS spawning biomass has been located in recent years, or in northeast PWS north and east of a line from Johnstone Point to Point Freemantle. Areas open to closed pounding in northeast PWS would depend on sufficient available spawning biomass and effort that may be poised to take advantage of the biomass. Of the 128 limited entry permit holders, seven indicated their intention to operate open pounds, while 17 permit holders advised the department of their intention to operate closed pounds. Two permit holders declared they would not participate in the 1999 fishery. A total of 102 permit holders did not respond by the April 1 open pound reporting deadline. These permit holders would be granted a closed pound blade quota in the event they decide to participate in the fishery. The closed pound fishery occurred in the waters of St. Matthews Bay in the Eastern District and the open pound fishery took place in Port Chalmers in the Montague Island area. Permit holders began staging pounds on April 15. The two open pound permit holders had their pound and kelp in the water by April 17. Seven permit holders operating closed pound structures also had their kelp in the water by the 17th and began seining herring for the introduction into pounds that day. Due to the limited time available to introduce herring into closed pounds and the overall low abundance of herring, few permit holders participated in the 1999 pound fishery.

The first aerial survey of the season was flown on March 25. Approximately five miles of spawn and less than 50 tons of herring were observed from Simpson Bay to Knowles Head. The aerial survey flown on March 28 from Simpson Bay to the Montague Island area, including the northern shore and Naked Island, observed less than one mile of spawn and five tons of herring in Simpson Bay.

On March 30, it was announced that open pounds could be operated in the entire Prince William Sound Management Area beginning 12:00 noon Thursday, April 1. On April 1, the closed pound fishery was placed on 48-hour notice at effective 12:00 noon that day. It was anticipated that the closed pound fishery would occur in either in the waters Port Fidalgo or Port Gravina. The area and duration of openings was dependent on aerial survey results indicating a sufficient exploitable biomass was present. An aerial survey flown on Friday, April 2 included only eastern PWS due to deteriorating weather conditions. No herring or spawn was observed. The aerial survey conducted on Sunday April 4 included eastern and northern PWS,

Naked Island, and the Montague Island area. Approximately five tons of herring were observed in Beartrap and St. Matthews Bays. Some light and old spawn was also observed in St. Matthews and Sheep Bays.

An aerial survey conducted on Tuesday April 6 included the eastside of PWS, the north shore, Naked Island and the Montague Island area. Approximately 40 tons of herring were observed in Eaglek Bay; 20 tons were seen in St. Matthews Bay; and 15 tons were seen in Sheep Bay. Some light spawn was also observed in St. Matthews and Sheep Bays. An aerial survey conducted in eastern PWS on April 7 observed approximately 10 tons of herring and less than a mile of spawn. An additional 50 tons of herring and about a mile of spawn were also seen in St. Matthews Bay. On April 8, an aerial survey of eastern PWS, the north shore, Naked Island and the Montague Island area observed approximately 400 tons of herring along the shoreline between Hell's Hole and St. Matthews Bay. 50 tons of herring were also seen near the village of Tatitlek and 60 tons were seen in the Montague Island area. Light spawn was also observed in Hell's Hole, Point Gravina and near Tatitlek. On Friday, April 9, an aerial survey of eastern PWS and the Montague Island area conducted under poor to fair conditions, observed herring spawn near Virgin Bay and in St. Matthews, Olsen, Landlocked and Sheep bays. Approximately eight tons of herring were seen in Sheep Bay, 150 tons in St. Matthews Bay, 10 tons in Olsen Bay, 30 tons in Fish Bay and 100 tons were observed in Virgin Bay.

On Monday, April 12 the advanced notice for the closed pound fishery was reduced to 24 hours effective 12:00 noon. The advance notice was reduced as some permit holders had arranged to receive kelp from Southeast Alaska and the observed biomass appeared to be building. Although the peak biomass observed in eastern PWS was less than 500 tons, it was felt that the general trend had been a slow but steady improvement in the size of the herring biomass. The aerial survey flown on April 12 in the Montague Island and eastern PWS area observed approximately 400 tons of herring. An estimated 250 tons of herring on the verge of spawning were observed in Stockdale Harbor. An estimated 150 tons were observed in the west arm of Two Moon Bay. Four tenths of a mile of spawn was observed in Fish Bay and some spawn was seen in Tatitlek Narrows.

On Wednesday, April 14, the advance notice for the closed pound fishery was reduced to 12 hours effective 12:00 noon, Thursday April 15. The notice was reduced primarily based on a steady increase in roe maturity and increasing tides. Since it appeared that no more than 17 permit holders would participate in the fishery and most had kelp in hand or would soon be receiving kelp, the department announced on April 15 that the waters of Prince William Sound north and east of a line from Point Freemantle to Johnstone Point were open to the introduction of herring into closed pounds effective 12:00 noon on Friday, April 16. Waters of Tatitlek Narrows from the ferry dock to Black Point remained closed to seining. An aerial survey was flown on April 16 in eastern PWS and the Montague Island area. Approximately one ton of herring was observed in Fish Bay, one ton in Two Moon Bay, 15 tons between Porcupine Point and Knowles Head and 54 tons were seen from Knowles Head to Hell's Hole. Less than one mile of spawn was seen east of Red Head. On Saturday, April 17, an aerial survey conducted in eastern PWS and the Montague Island area observed approximately 2000 tons of herring from Rocky Bay to Port Chalmers, two tons were seen in Sheep Bay, and 18 tons between Hell's Hole and Red Head. Approximately one mile of spawn was seen in eastern PWS and about a mile and a half was found around Montague Island.

On Sunday, April 18, the department announced that seining for introduction of herring into closed pounds would end effective 12:00 noon, Tuesday April 20. It was further stipulated that all closed pound permit holders must release herring in their pounds by Sunday, April 25. All kelp, with or without product, was also required to be out of the water by Sunday, April 25. An aerial survey conducted on Sunday, April 18 in eastern PWS and the Montague area observed 20 tons of herring in Sheep Bay, 1 ton in Two Moon Bay,

10 tons near Fish Bay, 10 tons in Galena Bay and 530 tons from Rocky Bay to Port Chalmers. Very light spawn was observed in Galena Bay, Fish Bay, Hell's Hole, Montague Point and in Port Chalmers. Approximately 2.5 miles of spawn was observed in Rocky Bay. During an aerial survey of eastern PWS and the Montague Island on Monday, April 19 seven tons of herring and a quarter mile of spawn were observed in Sheep Bay; five tons and a half mile of spawn were in St. Matthews; 10 tons were between Hell's Hole and Red Head; 2 miles of spawn were in Fish Bay; 35 tons were in Landlocked Bay; 10 tons were in Galena Bay; and 75 tons of herring and two miles of spawn were seen in Rocky Bay. Less than a quarter mile of spawn was observed at the reef on Montague Point and in Stockdale Harbor. On Monday, April 20, an aerial survey of eastern PWS and the Montague Island area was flown. Approximately five tons of herring was observed in Simpson Bay; one ton of herring and less than a quarter mile of spawn were in Sheep Bay; five tons were in Snug Corner Cove; less than a quarter mile of spawn was in Fish Bay; 25 tons were in Landlocked Bay; five tons of herring and two miles of spawn were in Rocky Bay; and one ton of herring and less than a quarter mile of spawn was in Port Chalmers. The aerial survey conducted on Monday, April 22 in the Montague Island area under unfavorable conditions observed no herring and less than a half mile of spawn in Port Chalmers. An aerial survey conducted on Monday, April 24 of eastern PWS and the Montague Island area observed no spawn and 15 tons of herring in Landlocked Bay and 8 small schools of herring totaling 50 tons between Rocky Point and Virgin Bay in the Tatitlek Narrows. The last aerial survey of eastern PWS and the Montague Island area for the season was flown on Monday, April 28. In response to reports of herring south of Port Chalmers, the survey was extended to include both Hanning Bay and Macleod Harbor on Montague Island. No signs of herring, spawning activity or sea lion and bird feeding were found on or near Montague Island. The only herring observed during the survey were three small schools near Virgin Bay totaling approximately eight tons.

Harvesting of spawn on kelp from pounds commenced on Saturday, April 24. A total of nine permit holders participated in the fishery. The two closed pounds (with three permit holders in one pound structure and four in the another) operated the entire season within St. Matthews Bay in Port Fidalgo. The two permit holders operating the single open pound were set up in Stockdale Harbor. The total harvest for the seven closed pound permit holders was 10,000 pounds of product, while the harvest for the two open pound permit holders was 12,307 pounds of spawn on kelp.

Viral Hemorrhagic Septicemia In The Spawn-On-Kelp Pound Fishery

In the spring of 1993, herring seen near Montague Island were exhibiting odd schooling behavior. When these fish were examined, lesions were observed on the outside of their bodies. Tissue samples sent to the ADF&G pathology laboratory in Juneau revealed that the lesions and odd swimming behavior were due to infection by a virus, viral hemorrhagic septicemia or VHS. Additional herring samples collected in 1994 were examined and found to be infected with both a fungus: *Ichthyophonus hoferi* (29%) and VHS (5%). Laboratory results from the study of *Ichthyophonus* indicate that this infection is not by itself lethal to herring. The same cannot be said of VHS. In laboratory studies, mortality in herring infected with VHS ranged from 20% up to 100%. It appears that the virus that causes VHS may be present in a latent state in the PWS herring stock. Values for latency in juvenile herring range from 10% - 15%. VHS has also been found in herring from Sitka Sound in Southeast Alaska. Stressing herring infected with VHS causes expression of the disease and leads to the transmission of the disease to non-infected herring. Based on results from laboratory and field studies, it is clear that stress caused by capturing and restraining herring in pounds may lead to the rapid expression of VHS by these fish. Preliminary evidence indicates closed pounding increases the prevalence of VHS and may hinder population recovery.

In the spring of 1997, a 2-year study was initiated to determine if activities involved with the PWS closed pound fishery were associated with increased VHS infections among the captured and confined herring. In the spring of 1997, herring and water samples were collected from three closed pounds after the herring were introduced to the pound. Herring density between pounds was variable. Tissue samples from 40 herring per pound were collected daily until the herring were released. Water samples were also collected daily from inside each pound and three meters from the pound. The length, weight and sex of all herring collected were recorded and scale samples were taken to establish the ages of the herring sampled.

In the spring of 1998, the second part of the two-year study was conducted. Sampling methodology was slightly different from procedures in 1997. One difference was that herring were put on ice prior to tissue being taken while in 1997, the herring were kept alive until examined. Another difference was that the water samples collected in 1998 were diluted with a preservative and not frozen prior to analysis. Samples of forty herring were again collected from each of three pounds.

Results from the samples collected in 1997 indicated that the prevalence of VHS in all pounds peaked after four days of confinement and declined to low levels after six days. VHS was even more prevalent in 1998 than in 1997. Peaks of VHS prevalence as high as 87% were found after eight days confinement in all three pounds following initially low prevalences of VHS. A bimodal VHS prevalence pattern was indicated by significant increases on the second and sixth day of confinement.

Herring age distribution in two of the three pounds studied in 1997 was nearly identical, consisting mostly of 9-year-old herring (40%). The remaining pound contained primarily 3-year-old herring (60%) and only 5% 9-year-old herring. VHS prevalence was associated primarily with 4 to 6-year-old (20% in each year class) and decreased with age. VHS prevalence was significantly greater in females than in males.

The age composition of herring sampled in 1998 was nearly identical between pounds. Age classes were dominated by 3-year-old herring with few herring 7 years or older present. Unlike impounded herring from the 1997 study, prevalence of VHS in males (36.4%) and females (34%) was not significantly different.

None of the water samples collected in 1997 tested positive for VHS. This may be due to the method of collection and transport, as the samples were thawed and refrozen several times prior to analysis. Laboratory studies have demonstrated an approximate 90% decrease in VHS concentration in water samples following freeze-thaw cycles. Samples collected in 1997 underwent at least three freeze-thaw cycles prior to examination.

No VHS was recovered from water samples collected in 1998 from inside the herring pounds prior to the introduction of herring. However, low concentrations of VHS were found in water samples from inside of the pounds when herring were initially put into the pound. VHS was also found outside the pounds as early as the second day after herring had been introduced. Waterborne VHS concentrations inside the pounds followed a bimodal pattern with a small peak occurring within four days after introduction of herring and a second larger peak occurring just prior to the release on the eighth day of confinement. Concentrations of VHS in the water samples from inside the pounds continued to increase throughout the study period. Laboratory tests have found that the concentrations of waterborne VHS found outside the pounds were lethal to native herring.

The results of this study indicate that the confinement of apparently healthy herring in spawn-on-kelp pounds often leads to increased infections of VHS that peak soon after capture. The magnitude, duration,

and severity of the infection depend upon many factors including herring age and immune status, shedding intensity, and fish density.

A mechanism to explain VHS infection in closed pounds has been proposed based on the available data. Wild herring, a portion of which carry and shed low levels of waterborne VHS are captured and introduced into a pound. Confinement increases the density, thereby increasing both the stresses on the herring and probability of transmission of infectious waterborne VHS particles. If few fish initially shed virus, and if a portion of the population is already immune to low levels of waterborne virus, relatively few fish are infected immediately after impoundment. These early VHS-positive fish constitute the first prevalence peak and either die from VHS with high viral concentration after a brief period in the pound or recover from the infection. VHS shed into the water from the initial carriers then infects other fish that become infected and shed more VHS, which accounts for the second peak of infection and increasing viral concentration in the surrounding water.

Although density of impounded herring may influence the magnitude of VHS infection, a more important factor is exposure of a susceptible herring population to sufficient levels of waterborne VHS. A group of susceptible herring confined at high densities will not undergo mass and simultaneous infection unless a small percentage of the population is VHS-positive and sheds waterborne virus. Similarly, a group of confined, immune herring will not undergo mass and simultaneous infection even if exposed to waterborne virus shed by a small percentage of VHS-positive fish. Exposure of a susceptible group of herring to waterborne VHS is believed to account for the increased viral prevalence among confined herring, rather than re-activation of latent infections, because isolation studies of individual herring did not result in viral prevalences as high as seen among fish held in a community tank.

Infections of VHS were less common among older herring than among young herring sampled from closed pounds in 1997 and 1998, indicating that older herring are less susceptible to infection by VHS than are younger herring. Older herring are believed to develop an immunity to VHS through exposure to low level waterborne virus at a young age and subsequent recovery from active, but non-lethal, infections. Low levels of waterborne VHS have been detected near free-ranging herring in PWS, which indicates that exposure of herring to low levels of VHS does occur in nature and constitutes a likely source of infection for subsequent production of protective antibodies. Older herring that have survived prior exposure to VHS have a selective advantage. However, a high proportion of young herring whose immune systems are not fully developed and which do not produce protective antibodies for VHS may die from unusually high VHS exposures that follow capture and confinement.

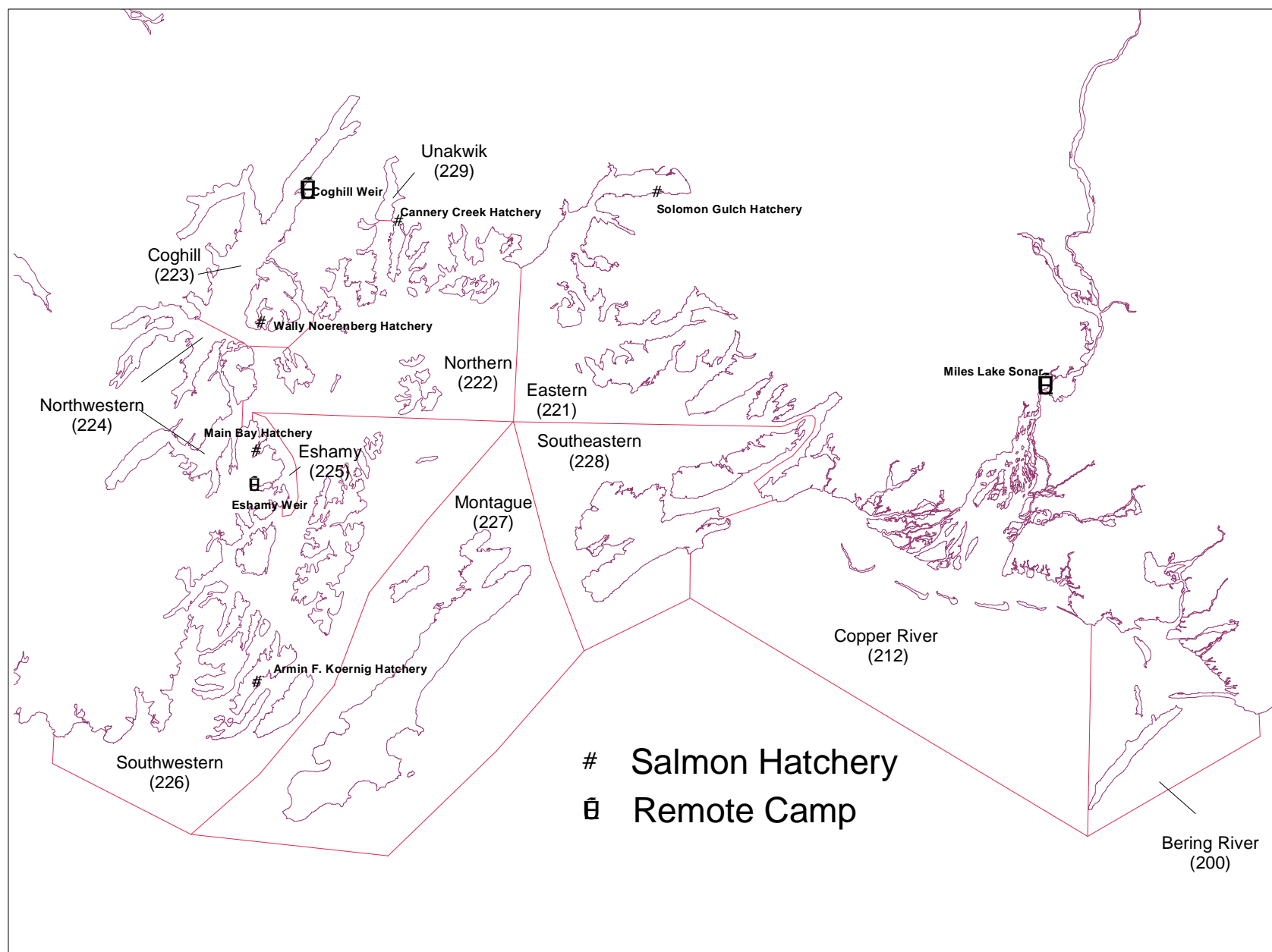
The utilization of older herring age classes (primarily 5-9 years old) during the 1997 pound fishery resulted in viral prevalence peaks as high as 25%, which was significantly less than the 88% which occurred when younger age classes (primarily 3 year olds) were used in the closed pounds operated in 1998. Therefore, one method to reduce the likelihood of VHS infection occurring in closed pounds would be to base management of the fishery on the age composition of the returning herring. One management option would be to not allow the fishery to occur when the returns are predominately younger fish. Besides increasing the likelihood for massive VHS infection and the potential loss of young fish from the population due to mortality from disease, the use of smaller, younger herring in the pound fishery frequently results in poor quality product. Since the density of herring in the pound is related to expression of VHS, another management option would be to restrict the tonnage of herring permit holders that may be put into the pound. This option has its own drawbacks as the department and FWP have long acknowledged that short of removing all herring from a closed pound, no method exists to accurately determine the amount of herring put into a pound. In 1996, the Board of Fisheries, in recognition of the potential threat that diseased

herring in closed pounds might pose to the general population, provided the department the authority to determine if these impounded herring may be released into the wild. In 1997, the department harvested herring from the disease study pounds to prevent their release into the wild. It was the department's intent to sell the herring, but local processors were unwilling to purchase these low quality herring. The last alternative will be to eliminate closed pounding as a gear type and rely on open pounds as the only legal pound fishery gear.

1999-2000 Outlook

The preliminary forecast for the 2000 herring spawning biomass in Prince William Sound is 23,987 tons. By age class, the forecasted contributions to the spring 2000 spawning biomass are expected to be 7% age-3, 0.1% age-4, 6% age-5, 41% age-6, 23% age-7, 15% age-8, and 8% age 9+. The spring spawning biomass is forecasted to have an overall average size of 112 grams. Although the Age Structure Analysis (ASA) model predicts that the spring of 2000 herring spawning biomass will be slightly above the 22,000 ton minimum threshold, the model assumes that an average age-3 recruitment to the fishery will occur over the coming winter months. As the herring samples collected last spring indicated, very few age-3 herring had recruited to the spawning biomass in 1999. The year 2000 forecast predicts an extremely low contribution from age-4 herring in next spring's spawning biomass. Results from hydroacoustic surveys, aerial surveys, and disease sampling in 1999 appear to indicate that the Prince William Sound herring population suffered a decline of approximately 40%. This decline was centered primarily around age-3 and age-4 herring, and was likely the result of another outbreak of viral hemorrhagic septicemia (VHS). Younger aged herring appear to be particularly susceptible to this virus. While there were very few age-3 herring seen in samples collected in the spring of 1999, the decline may have been equally severe among herring aged 1 and 2. If, next spring, the predicted age-3 recruitment again fails to materialize, the size of the PWS herring population will likely continue to decline, even in the absence of a commercial fishery. Consecutive years of low recruitment will further delay the recovery of the herring population to a sustainable size that is capable of supporting a commercial harvest.

On September 29, 1999 the department canceled the 1999 food/bait fishery, and all 2000 spring herring fisheries including the seine and gillnet sac roe harvests, the spawn-on-kelp in pound fishery, and the wild spawn-on-kelp harvest. The department will continue to monitor the PWS herring biomass this fall and next spring to assess growth and recruitment. An ongoing disease study will continue to examine the incidence of VHS in the PWS herring population this fall and next spring.



Appendix A.1. Prince William Sound Area showing commercial fishing districts, salmon hatcheries, weir locations and Miles Lake sonar camp.

Appendix A.2. Commercial salmon harvest by species, gear type and district in the Prince William Sound Management Area, 1999.

District	Effort	Chinook	Sockeye	Coho	Pink	Chum	Total
Eastern	127	51	8,613	68,501	12,305,629	106,966	12,489,760
Northern	98	15	3,252	834	4,981,085	11,002	4,996,188
Coghill	62	34	3,229	338	3,509,722	621,349	4,134,672
Southwestern ^a	100	219	8,569	7,157	9,511,998	11,303	9,539,246
Montague	57	154	486	393	189,641	638,932	829,606
Southeastern	36	1	379	332	914,907	83,147	998,766
Unakwik	1	1	386	0	0	2	389
Purse Seine	139	475	24,914	77,555	31,412,982	1,472,701	32,988,627
Bering River ^a	66	42	13,697	9,852	204	96	23,891
Copper River ^a	518	62,337	1,682,559	153,061	10,205	25,321	1,933,483
Unakwik ^a	15	4	8,544	5	0	296	8,849
Coghill ^a	239	401	106,028	1,114	32,408	689,210	829,161
Eshamy	104	30	86,032	2,036	127,082	13,120	228,300
Drift Gillnet	523	62,814	1,896,860	166,068	169,899	728,043	3,023,684
Eshamy ^a	21	131	74,378	1,092	43,443	11,101	130,145
Set Gillnet	21	131	74,378	1,092	43,443	11,101	130,145
Solomon Gulch	1	0	8	0	4,379,659	334	4,380,001
Cannery Creek	1	0	0	0	2,075,361	0	2,075,361
Wally Noerenberg	1	0	0	0	3,860,431	775,552	4,635,983
Main Bay	0	0	0	0	0	0	0
Armin F. Koernig	1	0	0	0	2,814,760	1,294	2,816,054
Gulkana	1	0	28,769	0	0	0	28,769
Hatchery ^b	5	0	28,777	0	13,130,211	777,180	13,936,168
Donated Fish	104	0	141	0	241,390	0	241,531
ADF&G Test Fish	1	0	9,372	0	0	30	9,402
Confiscated Fish	8	14	851	39	5,731	200	6,835
Total	113	14	10,364	39	247,121	230	257,768
Prince William Sound							
Total		63,434	2,035,293	244,754	45,003,656	2,989,255	50,336,392

^a Does not include salmon taken for home use as reported on fish tickets.

^b Hatchery sales for hatchery operating costs. Includes meal production/ roe salvage sales, carcass sales and processor discards. Excludes post egg-take roe sales at hatcheries.

Appendix A.3. Commercial salmon harvest by species from all gear types
Prince William Sound Area, 1971 - 1999.

Year ^a	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1971	20,142	741,945	327,697	7,312,730	579,552	8,982,066
1972	23,003	976,115	124,670	57,090	46,088	1,226,966
1973	22,638	473,044	199,019	2,065,844	740,017	3,500,562
1974	20,602	741,340	76,041	458,619	89,210	1,385,812
1975	22,325	546,634	84,109	4,453,041	101,286	5,207,395
1976	32,751	1,008,912	160,494	3,022,426	370,657	4,595,240
1977	22,864	943,943	179,417	4,536,459	573,166	6,255,849
1978	30,435	505,509	312,930	2,917,499	489,771	4,256,144
1979	20,078	369,583	315,774	15,615,810	349,615	16,670,860
1980	8,643	208,724	337,123	14,161,023	482,214	15,197,727
1981	20,782	784,469	396,163	20,558,304	1,888,822	23,648,540
1982	47,871	2,362,328	623,877	20,403,423	1,336,878	24,774,377
1983	53,879	908,469	365,469	13,977,116	1,048,737	16,353,670
1984	39,774	1,303,515	609,484	22,119,309	1,229,185	25,301,267
1985	43,735	1,464,563	1,025,046	25,252,924	1,321,538	29,107,806
1986	42,128	1,288,712	426,240	11,410,302	1,700,906	14,868,288
1987	41,909	1,737,989	175,214	29,230,303	1,919,415	33,104,830
1988 ^b	31,797	767,674	477,816	11,820,121	1,843,317	14,940,725
1989 ^b	32,006	1,175,238	424,980	21,886,466	1,001,809	24,520,499
1990 ^b	22,163	911,607	524,274	44,165,077	967,384	46,590,505
1991 ^c	35,355	1,734,544	641,854	37,135,561	352,321	39,899,635
1992 ^d	41,306	1,771,612	619,460	8,637,116	334,376	11,403,870
1993 ^e	32,005	1,851,133	445,612	5,761,097	1,186,365	9,276,212
1994 ^f	48,558	1,514,329	1,058,154	36,886,301	1,058,213	40,565,555
1995 ^f	67,083	1,523,464	992,798	16,221,493	864,245	19,669,083
1996 ^f	56,457	3,000,602	459,253	26,042,942	2,103,559	31,662,813
1997 ^f	52,482	4,163,074	83,113	25,836,563	2,227,190	32,362,422
1998 ^f	70,910	1,715,778	194,621	28,685,115	1,271,911	31,938,335
1999 ¹	63,434	2,035,293	244,754	45,003,656	2,989,255	50,336,392
Ten Year						
Average	45,833	1,936,138	544,412	25,125,773	1,136,737	28,788,893
(1989-98)						

^a Includes catches by all gear types and hatchery sales from the Eastern, Northern, Coghill, Unakwil Northwestern, Eshamy, Southwestern, Montague, Southeastern, Copper River and Bering River districts.

^b Includes confiscated and educational special use permits. Also includes hatchery sales harvests and test fish.

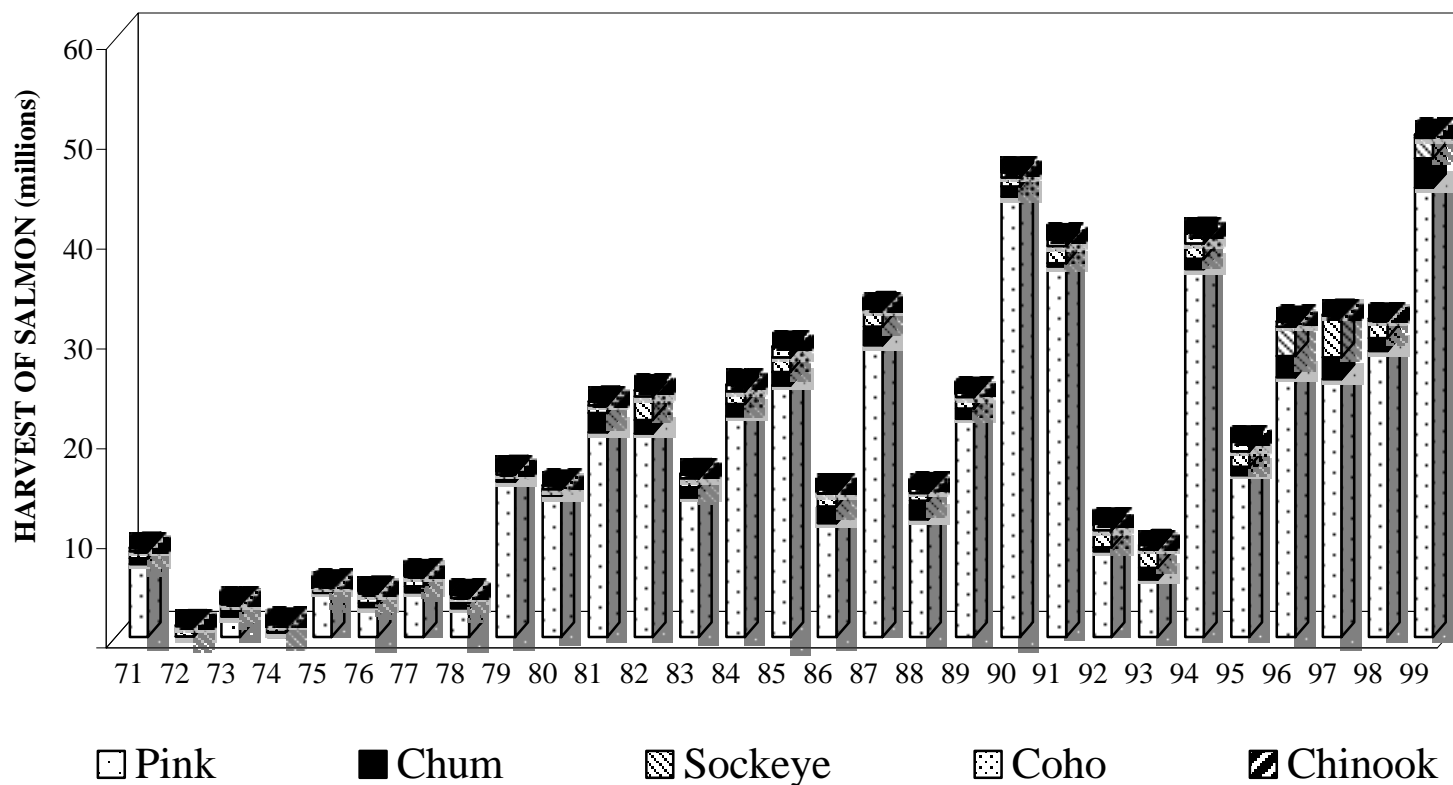
^c Includes confiscated and educational special use permits, hatchery sales harvests, donated and discarded fish.

^d Includes catches from confiscated and educational special use permits, hatchery sales harvest and test fish.

^e Includes catches from confiscated permits, hatchery sales harvests, donated fish harvest and test fish.

¹ Includes catches from confiscated permits, all hatchery sales harvests (including roe salvage) and test fish.

ALL SPECIES SALMON CATCH



Appendix A.4. Commercial salmon harvest by species for all gear types combined, Prince William Sound, 1971 - 99.

Appendix A.5. Mean price and estimated exvessel value of the total commercial salmon harvest by gear type, Prince William Sound, 1999.

PURSE SEINE

Species	Number	Pounds	Avg. Wt.	Price ^a	Value
Chinook	475	6,439	13.56	1.15	\$7,427
Sockeye	24,914	145,094	5.82	0.98	\$141,923
Coho	77,555	665,895	8.59	0.49	\$329,317
Pink	31,412,982	94,651,698	3.01	0.10	\$9,456,108
Chum	1,472,701	11,930,353	8.10	0.26	\$3,128,816
	32,988,627	107,399,479			\$13,063,591

DRIFT GILLNET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	62,814	1,350,953	21.51	4.08	\$5,510,840
Sockeye	1,896,860	11,375,472	6.00	1.76	\$20,048,000
Coho	166,068	1,340,084	8.07	0.55	\$733,022
Pink	169,899	571,684	3.36	0.08	\$43,612
Chum	728,043	5,995,777	8.24	0.26	\$1,529,765
	3,023,684	20,633,970			\$27,865,239

SET GILLNET

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	131	1,184	9.04	0.50	\$592
Sockeye	74,378	457,862	6.16	0.89	\$407,497
Coho	1,092	8,159	7.47	0.23	\$1,877
Pink	43,443	145,356	3.35	0.06	\$8,721
Chum	11,101	90,869	8.19	0.15	\$13,630
	130,145	703,430			\$432,317

HATCHERY SALES ^u

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	0	0			
Sockeye	28,777	143,894	5.00	1.00	\$143,855
Coho	0	0			
Pink	13,130,211	37,581,787	2.86	0.17	\$6,312,337
Chum	777,180	6,613,049	8.51	0.36	\$2,380,321
	13,936,168	44,338,730			\$8,836,513

OTHER GEAR ^c

Species	Number	Pounds	Avg. Wt.	Price	Value
Chinook	14	275	19.64	1.63	\$448
Sockeye	10,364	61,352	5.92	1.12	\$68,525
Coho	39	286	7.33	0.37	\$106
Pink	247,121	740,690	3.00	0.11	\$81,476
Chum	230	1,791	7.79	0.20	\$358
	257,768	804,394			\$150,913

Gear Type	Value of Catch	No. of Permits	Average Earnings
Purse Seine	\$13,063,591	139	\$93,983
Drift Gillnet	\$27,865,239	523	\$53,280
Set Gillnet	\$432,317	21	\$20,587
Subtotal- Value of CPF Catch	\$41,361,147		
Hatchery	\$8,836,513		
Other Gear	\$150,913		
GRAND TOTAL	\$50,348,573		

^a Mean prices are estimated at the end of the season based on the average of cash buyers and the advance prices paid by the canneries on the grounds. They do not reflect the spring adjustments paid by some companies.

^b Prices are an average of sales harvest prices excluding roe sales.

^c Includes the sales of confiscated fish.

Appendix A.6. Total commercial salmon harvest and estimated value by gear type and district, Prince William Sound Area, 1999.

District	Numbers of Fish						Estimated Value ^a
	Chinook	Sockeye	Coho	Pink	Chum	Total	
Eastern	51	8,613	68,501	12,305,629	106,966	12,489,760	2,609,767
Northern	15	3,252	834	4,981,085	11,002	4,996,188	1,786,288
Coghill	34	3,229	338	3,509,722	621,349	4,134,672	2,808,494
Southwestern	219	8,569	7,157	9,511,998	11,303	9,539,246	3,649,857
Montague	154	486	393	189,641	638,932	829,606	1,632,366
Southeastern	1	379	332	914,907	83,147	998,766	571,884
Unakwik	1	386	0	0	2	389	4,934
PURSE SEINE TOTAL	475	24,914	77,555	31,412,982	1,472,701	32,988,627	\$13,063,591
Bering River	42	13,697	9,852	204	96	23,891	196,736
Copper River	62,337	1,682,559	153,061	10,205	25,321	1,933,483	24,746,840
Coghill	4	8,544	5	0	296	8,849	2,300,961
Eshamy	401	106,028	1,114	32,408	689,210	829,161	515,714
Unakwik	30	86,032	2,036	127,082	13,120	228,300	104,989
DRIFT GILLNET TOTAL	62,814	1,896,860	166,068	169,899	728,043	3,023,684	\$27,865,239
Eshamy	131	74,378	1,092	43,443	11,101	11,101	432,317
SET GILLNET TOTAL	131	74,378	1,092	43,443	11,101	11,101	\$432,317
Solomon Gulch	0	8	0	4,379,659	334	4,380,001	2,700,757
Cannery Creek	0	0	0	2,075,361	0	2,075,361	881,822
Wally Noerenberg	0	0	0	3,860,431	775,552	4,635,983	3,957,973
Main Bay	0	0	0	0	0	0	0
Armin F. Koernig	0	0	0	2,814,760	1,294	2,816,054	1,152,116
Gulkana	0	28,769	0	0	0	28,769	143,845
HATCHERY SALES TOTAL	0	28,777	0	13,130,211	777,180	13,936,168	\$8,836,513 ^b
Donated Fish	0	141	0	241,390	0	241,531	80,664
ADF&G Test Fish	0	9,372	0	0	30	9,402	61,196
Confiscated	14	851	39	5,731	200	6,835	9,053
OTHER GEAR TOTAL	14	10,364	39	247,121	230	257,768	\$150,913
PRINCE WILLIAM SOUND							
GRAND TOTAL	63,434	2,035,293	244,754	45,003,656	2,989,255	50,217,348	\$50,348,573

^a (Reported number of pounds delivered by species) x (estimated average price per pound for that species and district) = Actual value may vary.

^b Hatchery sales for hatchery operating costs. Does not include salmon roe sales.

Appendix A.7. Average price paid to permit holders for salmon, Prince William Sound, 1990-1999.

Species ^a	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
King Salmon	\$2.24									
Copper/Bering Districts		\$1.65	\$2.50	\$1.82	\$1.43	\$2.19	\$1.96	\$2.00	\$2.07	\$3.44
Prince William Sound		\$1.00	\$1.55	\$1.07	\$0.80	\$0.91	\$0.71	\$1.00	\$0.94	\$1.28
Sockeye Salmon										
Copper River	\$2.13	\$1.28	\$2.50	\$1.32	\$1.27	\$1.67	\$1.38	\$0.88	\$1.49	\$1.84
Bering River	\$2.13	\$1.28	\$2.50	\$1.40	\$1.06	\$1.44	\$1.21	\$0.88	\$1.35	\$1.81
Coghill/Unakwik Districts	\$1.50	\$1.28	\$1.55	\$0.93	\$0.94	\$0.75	\$0.82	\$0.80	\$1.24	\$1.60
Eshamy	\$1.45	\$1.28	\$1.55	\$0.86	\$1.19	\$1.06	\$0.85	\$0.80	\$1.11	\$0.89
General Purse Seine	\$1.50	\$1.00	\$1.55	\$0.83	\$0.88	\$0.94	\$0.73	\$0.85	\$1.06	\$1.18
Coho Salmon										
Copper/Bering Districts	\$0.97	\$0.65	\$0.90	\$0.80	\$0.74	\$0.52	\$0.53	\$0.30	\$0.46	\$0.58
Prince William Sound	\$0.97	\$0.45	\$0.90	\$0.77	\$0.60	\$0.42	\$0.36	\$0.30	\$0.33	\$0.33
Pink Salmon	\$0.30	\$0.12	\$0.18	\$0.16	\$0.16	\$0.18	\$0.07	\$0.12	\$0.13	\$0.15
Chum Salmon	\$0.70	\$0.40	\$0.55	\$0.68	\$0.45	\$0.45	\$0.13	\$0.27	\$0.22	\$0.21

^a Based on processor reports, fish tickets and other sources. Prices are monitored throughout the season and a weighted average is generally used. Prices generally do not reflect post season adjustments. Prices are only an estimate. Caution should be used if using these prices to estimate value.

Appendix A.8. Estimated exvessel value of the total commercial salmon harvest by gear type, Prince William Sound, 1989 - 99.

PURSE SEINE

Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook	23,731	2,178	1,732	2,044	379	1,104	1,169	570	3,422	4,386	7,427
Sockeye	128,766	219,753	113,493	313,794	169,236	432,156	205,178	111,337	151,532	127,854	141,923
Coho	389,124	388,516	49,165	277,682	21,288	208,661	327,260	314,773	125,946	124,325	329,317
Pink	15,967,454	29,428,887	8,148,452	2,950,733	1,469,531	12,537,403	6,736,581	4,445,231	6,795,323	8,565,392	9,456,108
Chum	2,031,356	1,792,801	107,202	125,639	22,344	164,181	152,047	386,967	1,742,759	950,912	3,128,816
	\$18,540,431	\$31,832,135	\$8,420,044	\$3,669,892	\$1,682,778	\$13,343,505	\$7,422,236	\$5,258,878	\$8,818,982	\$9,772,869	\$13,063,591

DRIFT GILLNET

Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook	1,866,575	1,269,847	1,310,334	2,504,789	1,180,382	1,534,059	3,573,848	2,259,958	2,367,538	3,341,148	5,510,840
Sockeye	17,853,841	11,452,509	11,817,211	18,901,370	11,767,820	9,209,486	12,864,113	23,037,225	19,796,170	13,223,761	20,048,000
Coho	1,533,704	3,716,774	3,328,387	4,155,833	2,702,999	7,129,685	4,207,678	1,450,095	57,798	379,366	733,022
Pink	880,618	1,999,326	104,274	213,996	115,040	127,997	165,462	12,028	83,398	249,293	43,612
Chum	617,440	3,643,487	928,104	1,037,032	3,091,611	2,393,837	1,709,831	1,229,842	1,567,526	1,035,808	1,529,765
	\$22,752,177	\$22,081,943	\$17,488,310	\$26,813,021	\$18,857,852	\$20,395,065	\$22,520,932	\$27,989,149	\$23,872,430	\$18,229,376	\$27,865,239

SET GILLNET

Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook	0	1,048	1,156	1,973	848	121	182	148	159	25	592
Sockeye	0	100,106	1,300,375	1,355,943	517,182	638,164	181,653	697,572	1,055,286	177,723	407,497
Coho	0	2,859	1,625	8,321	4,343	3,513	2,003	612	340	336	1,877
Pink	0	370,015	7,587	248,170	48,618	117,298	18,892	2,373	20,477	16,659	8,721
Chum	0	635,185	191,271	22,316	97,911	18,675	21,018	11,312	17,242	337	13,630
	\$0	\$1,109,214	\$1,502,013	\$1,636,724	\$668,901	\$777,770	\$223,747	\$712,017	\$1,093,504	\$195,079	\$432,317

HATCHERY SALES

Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook	0	0	0	27,218	26,736	11,526	11,692	91	1,252	22,621	0
Sockeye	0	451	0	1,573,671	371,621	358,077	380,378	444,198	1,381,948	953,857	143,855
Coho	141,632	79,481	216,146	352,390	11,712	82,571	28,759	100,413	7,090	63,980	0
Pink	16,119,012	10,443,198	2,573,773	2,196,778	1,472,128	7,222,015	4,157,847	4,076,578	5,814,214	6,283,525	6,312,337
Chum	552,999	101,985	14,609	157,616	1,576,882	1,598,524	895,509	1,430,814	1,758,276	1,261,354	2,380,321
	\$16,813,643	\$10,625,115	\$2,804,528	\$4,307,673	\$3,459,882	\$9,272,731	\$5,474,186	\$6,052,094	\$8,965,780	\$8,585,338	\$8,836,513

OTHER GEAR

Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook	1,319	2,062	3,699	143	154	143	25	76	0	5,004	448
Sockeye	40,471	10,095	9,638	80,141	52,272	3,686	27,880	2,582	2,085	2,085	68,525
Coho	5,056	3,513	2,967	5,293	751	89	479	0	0	10	106
Pink	73,675	12,746	7,971	2,066	9,084	28,287	88,152	0	1	271	81,476
Chum	11,890	15,467	1,718	13,389	16,066	35,139	4,234	1	190	13	358
	\$132,860	\$43,883	\$25,993	\$101,031	\$78,327	\$67,344	\$120,771	\$2,659	\$2,276	\$7,383	\$150,913

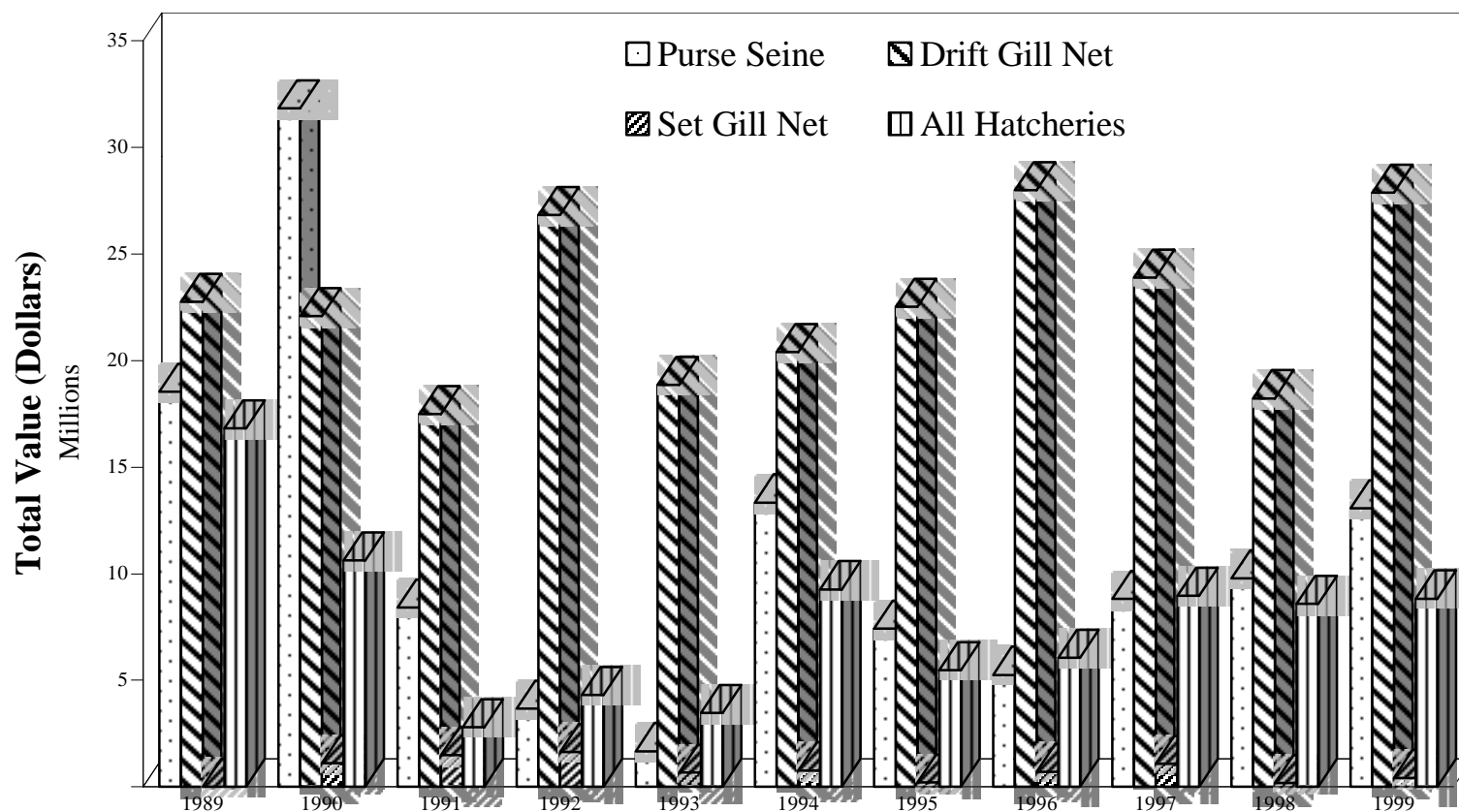
AVERAGE EARNINGS

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Purse Seine	\$76,298	\$119,670	\$33,281	\$17,729	\$11,686	\$78,032	\$39,691	\$58,432	\$77,359	\$65,590	\$93,983
Drift Gillnet	\$46,623	\$42,141	\$33,696	\$50,782	\$36,688	\$39,990	\$43,477	\$54,989	\$45,909	\$34,922	\$53,280
Set Gillnet	\$0	\$38,249	\$51,794	\$54,557	\$22,297	\$29,914	\$8,606	\$26,371	\$42,058	\$12,192	\$20,587

NUMBER OF PERMITS FISHED

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Purse Seine	243	266	253	207	144	171	187	90	114	149	139
Drift Gillnet	488	524	519	528	514	510	518	509	520	522	523
Set Gillnet	0	29	29	30	30	26	26	27	26	16	21

Historic Value of Prince William Sound Fisheries



Appendix A.9. Exvessel value of the commercial salmon harvest by gear type, 1989 - 99.

Appendix A.10. Preseason harvest projections for the 1999 commercial salmon fishery by district and species, Prince William Sound Area.

COMMERCIAL HARVEST (1,000's of fish)										
District ^a	Chinook		Sockeye		Coho		Pink		Chum	
	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range	Point Estimate	Range
Copper River ^u	53.0	32.2-73.9	990.0	450.0-1,530.0	304.2	64.4-825.1				
Bering River ^c					127.5	0.0-281.0				
Coghill ^u			47.8	0.0-230.4						
Eshamy ^e				0.0-5.9						
General P.W.S. Districts			10.8	8.3-13.4			5,200.0	0.0-10,500.0	390.0	70.0-1,160.0
Total Wild Stock	53.0	32.2-73.9	1,048.6	458.3-1,779.7	431.7	64.4-1,106.1	5,200.0	0.0-10,500.0	390.0	70.0-1,160.0
Solomon Gulch					113.1	89.0-137.1	1,700.0	0.0-6,500.0	10.0	0.0-20.0
Armin F. Koernig							2,900.0	1,300.0-4,300.0		0.00-10.0
Wally Noerenberg ¹					30.0	23.5-36.9	5,500.0	0.0-6,900.0	2,040.0	1,050.0-2,800.0
Cannery Creek							4,300.0	2,500.0-5,900.0		
Main Bay ^g										
Gulkana			500.0	230.0-780.0						
Total Hatchery			500.0	230.0-780.0	143.1	112.5-174.0	14,400.0	3,800.0-23,600.0	2,050.0	1,050.0-2,830.0
Total Hatchery and Wild	53.0	32.2-73.9	1,548.6	688.3-2,559.7	574.8	176.9-1,280.1	19,600.00	3,800.0-34,100.0	2,440.0	1,120.0-3,990.0

^a Formal forecast procedures are used for estimating wild stock returns for pink and chum salmon in Prince William Sound. Hatchery contributions are based on known fry releases and average marine survival rates. General P.W.S. sockeye production is based upon average harvest. Harvest estimates are made only for those species which constitute a significant portion of the catch. The harvest projections do not include salmon projected for harvest by hatcheries for

^b Formalized forecast procedures are used for Copper River chinook and sockeye returns. Copper River coho catches are based on mean annual harvest.

^c Bering River coho harvest estimates are based on mean annual harvest.

^d Coghill sockeye returns are formally forecast using a sibling relationship model for the major age class and spawner recruit relationships for other age classes. The Coghill District's wild pink and chum harvest is included in the "General PWS Districts" projection.

^e No formal forecast exists for Eshamy sockeye production. The pink and chum harvest is included in the "General PWS Districts" projection.

¹ WHN chum harvest estimate includes all on-site and remote returns of chum salmon.

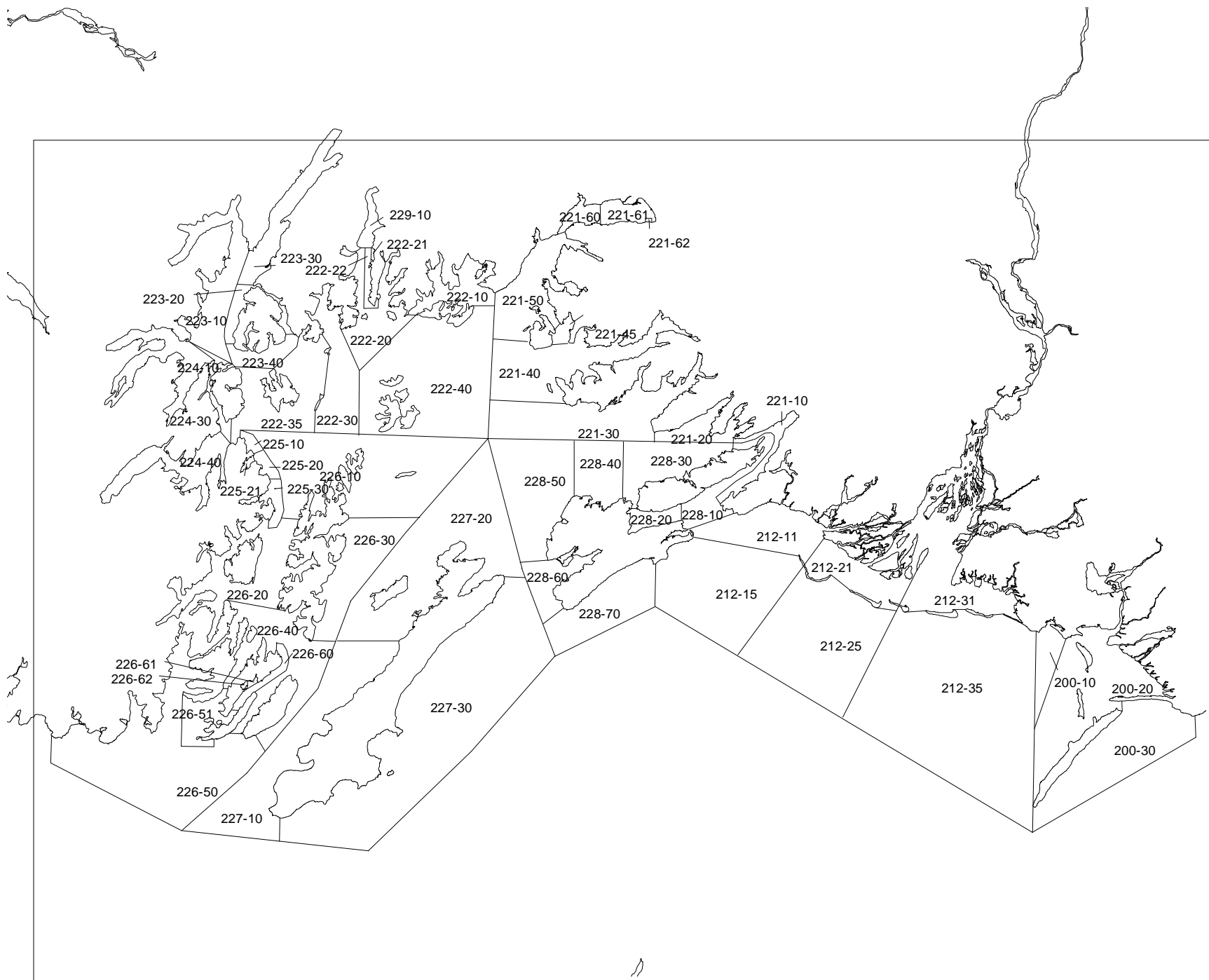
^g Main Bay sockeye harvest estimate includes all on-site and remote returns of sockeye salmon.

Appendix A.11. A listing of finfish processors, their location of operation, and type of product processed, Prince Willam Sound Area, 1999.

Executive Names, Address Location of Operations	Processor Code	Type of Product	Executive Names, Address Location of Operations	Processor Code	Type of Product
Anchor Services Unlimited P.O. Box 606 Whittier, AK 99693 Paul McMullin	F3534	Salmon	Janda II P.O. Box 1268 Cordova, AK 99574 Kurt Goetzinger	F3433	Salmon
Cannery Row, Inc. P.O. Box 120 Cordova, Alaska 99574 Greg Meyer	F1673	Herring	Low Water Clam Company P.O. Box 2232 Cordova, Alaska 99574 Mitchell Nowicki	F0010	Salmon
Cook Inlet Processing P.O. Box 8163 Nikiski, Alaska 99635 John Dickerson	F0186 F2448	Salmon Herring	Nautilus Foods P.O. Box 727 Valdez, Alaska 99686 Tom Waterer	F2003	Salmon
Copper River Fine Seafoods P.O. Box 158 Cordova, AK 99574 Robyn Wamser	F2977	Salmon	New West Fish 601 W. Chestnut Bellingham, WA Jerry Thon	F0602	Herring
Dragnet Fisheries Co., Inc. P.O. Box 1260 Kenai, AK 99611 Don Stuart	F0030	Herring	Norquest Seafoods P.O. Box 260 Cordova, AK 99574 Bill Gilbert	F1484 F1486	Salmon Herring
Flopping Fresh P.O. Box 572 Bellingham, WA	F3265	Salmon	North Alaska Fisheries P.O. Box 92737 Anchorage, AK 99509 Jack Schulteis	F1681	Salmon Herring
Flyin Finn P.O. Box 2162 Cordova, AK 99574 Melvin Sary	F1845	Salmon	North Pacific Processors, Inc. P.O. Box 1040 Cordova, Alaska 99574 Ken Roemhildt	F0232	Salmon Herring
Glacier Creek Seafoods H.C. 52 Box 8610 Bird Creek, AK 99540 Steve Aberle	F1826	Salmon	Northern Victor Partnership 4209 21st West, Suite 402 Seattle, WA 98199 Peter Kuttel	F1319	Salmon
Glacier Fish P.O. Box 1989 Seward, AK Keith Bailey	F1979	Salmon	Ocean Beauty Seafoods P.O. Box 548 Cordova, AK 99574 Hap Symmonds	F1930	Salmon Herring
Great Pacific Seafoods, Inc. P.O. Box 710 Whittier, AK 99693 Nancy Davidson	F1989 F1267	Salmon	Peter Pan Seafoods, Inc. P.O. Box 1027 Valdez, Alaska 99686 James Poor	F1041	Salmon
Icicle Seafoods Inc. P.O. Box 8 Seward, Alaska 99664 Tim Schmidt	F0133 F0134 F0135 F0137	Salmon Herring	Potter's Own Fine Fish P.O. Box 1472 Cordova, AK 99574 Lynn and Carol Potter	F3346	Salmon
Inlet Fisheries P.O. Box 530 Kenai, Alaska 99611 Scott Earsley	F1039	Salmon	Prime Select Seafoods, Inc. P.O. Box 846 Cordova, Alaska 99574 Jeff Bailey	F1816	Salmon

Appendix A.11. (page 2 of 2)

Executive Names, Address Location of Operations	Processor Code	Type of Product	Executive Names, Address Location of Operations	Processor Code	Type of Product
Prince William Sound Aquaculture P.O. Box 1110 Cordova, Alaska 99574 Monica Bradley	F1901, F1903 F2465 F2902 F3468	Salmon Salmon roe	Wild Card Inc. P.O. Box 1871 Cordova, AK 99574 Lisa Walters	F1822	Salmon
Sahalee of Alaska, Inc. P.O. Box 104174 Anchorage, Alaska 99510 William Lind	F1485	Salmon	Winter King P.O. Box 1268 Cordova, AK 99574 Ralph Lohse	F3503	Salmon
Sea Hawk Seafoods P.O. Box 247 Valdez, AK 99686 Joe Haugsven	F0223	Salmon	Woodbine Alaska Fish Company P.O. Box 218 Egagik, Alaska 99633	F0214	Herring
Valdez Fisheries Development P.O. Box 125 Valdez, Alaska 99686 Dave Cobb/Laura Weaver	F1355	Salmon Salmon roe			



Appendix A.12. Prince William Sound Area showing commercial fishing districts and statistical reporting areas, 1999.

Appendix B.1. Commercial salmon catch by species in the Copper River District,
1974-1999.

Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1974	18,980	607,766	46,625	9,839	664	683,874
1975	19,644	335,384	53,805	236	807	409,876
1976	31,479	865,195	111,900	3,392	178	1,012,144
1977	21,722	602,737	131,356	23,185	335	779,335
1978	29,062	249,872	220,338	3,512	2,233	505,017
1979	17,678	80,528	194,885	1,295	107	294,493
1980	8,454	18,908	225,299	3,966	198	256,825
1981	20,178	477,662	310,154	23,952	1,799	833,745
1982	47,362	1,177,632	454,763	7,154	1,177	1,688,088
1983	52,500	626,735	234,243	7,345	2,217	923,040
1984	38,957	900,043	382,432	32,194	6,935	1,360,561
1985	42,214	927,553	587,990	19,061	5,966	1,582,784
1986	40,670	780,808	295,980	3,016	17,614	1,138,088
1987	41,001	1,180,782	111,599	31,635	14,796	1,379,813
1988	30,741	576,950	315,568	2,775	11,022	937,056
1989	30,863	1,025,923	194,454	25,877	5,845	1,282,962
1990	21,702	844,778	246,797	1,596	7,545	1,122,418
1991	34,787	1,206,811	385,086	1,246	20,220	1,648,150
1992	39,810	970,938	291,627	1,664	5,807	1,309,846
1993	29,727	1,398,234	281,469	9,579	13,002	1,732,011
1994	47,061	1,152,220	677,633	12,079	19,055	1,908,048
1995	65,675	1,271,822	542,658	19,809	56,100	1,956,064
1996	55,646	2,356,365	193,042	6,372	25,533	2,636,958
1997	51,273	2,955,431	18,656	8,483	2,465	3,036,308
1998	68,827	1,341,692	108,232	20,829	5,022	1,544,602
1999	62,337	1,682,559	153,061	10,205	25,321	1,933,483
Ten Year						
Average (1989-98)	44,537	1,452,421	293,965	10,753	16,059	1,817,737

Appendix B.2. Anticipated and actual weekly catch and escapement of sockeye salmon in the Copper River District drift gillnet fishery, 1999.

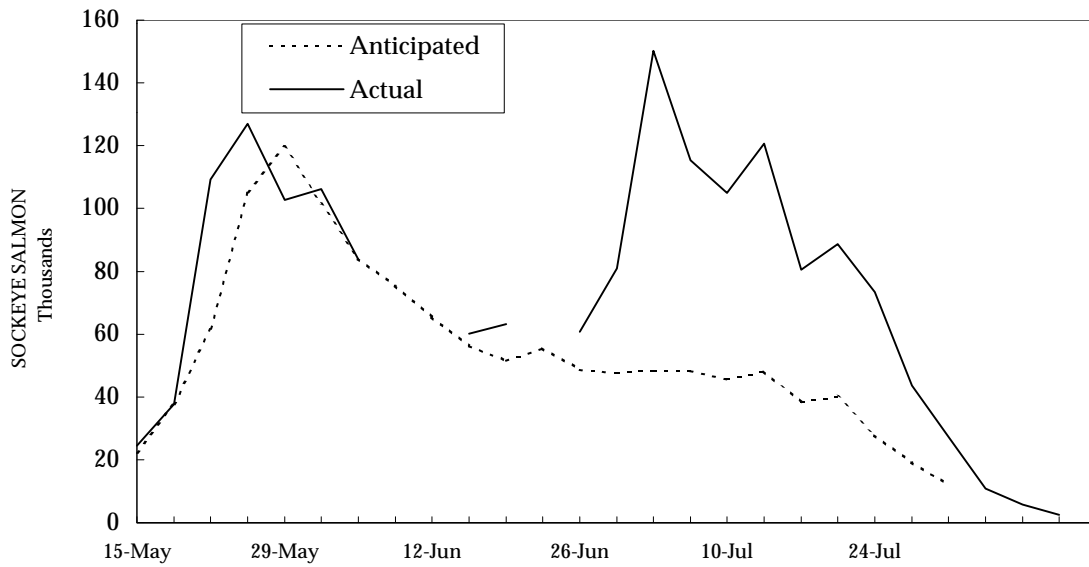
Semi-Weekly Date	Fishing Time (Hrs.)	Actual Catch	Anticipated Catch ^a	Anticipated Cumulative Escapement ^b	Actual Cumulative Escapement ^c
May 15 Sat	12	24,439	22,236	0	
May 19 Wed	12	37,804	37,757	2,318	
May 22 Sat	12	109,204	61,786	6,781	
May 26 Wed	12	126,961	105,077	22,384	2,412
May 29 Sat	24	102,698	119,652	43,502	6,857
June 02 Wed	24	106,090	101,573	81,725	20,825
June 05 Sat	12	83,850	84,062	119,063	28,688
June 09 Wed	0		75,372	171,822	53,514
June 12 Sat	0		65,489	209,286	121,915
June 16 Wed	12	60,120	56,166	249,345	202,407
June 19 Sat	12	63,199	51,618	274,404	242,095
June 23 Wed	0		55,513	304,133	295,096
June 26 Sat	24	60,651	48,728	326,315	342,012
June 30 Wed	24	80,914	47,653	356,193	406,871
July 03 Sat	36	150,144	48,506	385,647	446,895
July 07 Wed	36	115,377	48,331	435,498	479,877
July 10 Sat	36	104,940	45,730	480,132	526,193
July 14 Wed	36	120,579	48,013	540,350	583,324
July 17 Sat	36	80,564	38,329	584,556	635,746
July 21 Wed	48	88,713	40,226	635,869	694,940
July 24 Sat	48	73,413	27,736	661,987	739,182
July 28 Wed	48	43,628	19,197	691,210	788,221
July 31 Sat	48	27,337	12,102	710,305	819,899
Aug 4 Wed	36	10,773		727,985	850,951
Aug 7 Sat	36	5,694		735,938	
Aug 11 Wed	24	2,370		742,244	
Aug 14 Sat	0			745,594	
Aug 18 Wed	24	2,083		748,140	
Aug 21 Sat	0			749,073	
Aug 25 Wed	24	832		749,855	
Aug 28 Sat	0			749,822	
Sept 1 Wed	24	180			
Sept 4 Sat	0				
Season Total	720	1,682,557	1,260,852	749,822	

^a Based on average historic catches for comparable dates (1992-1998).

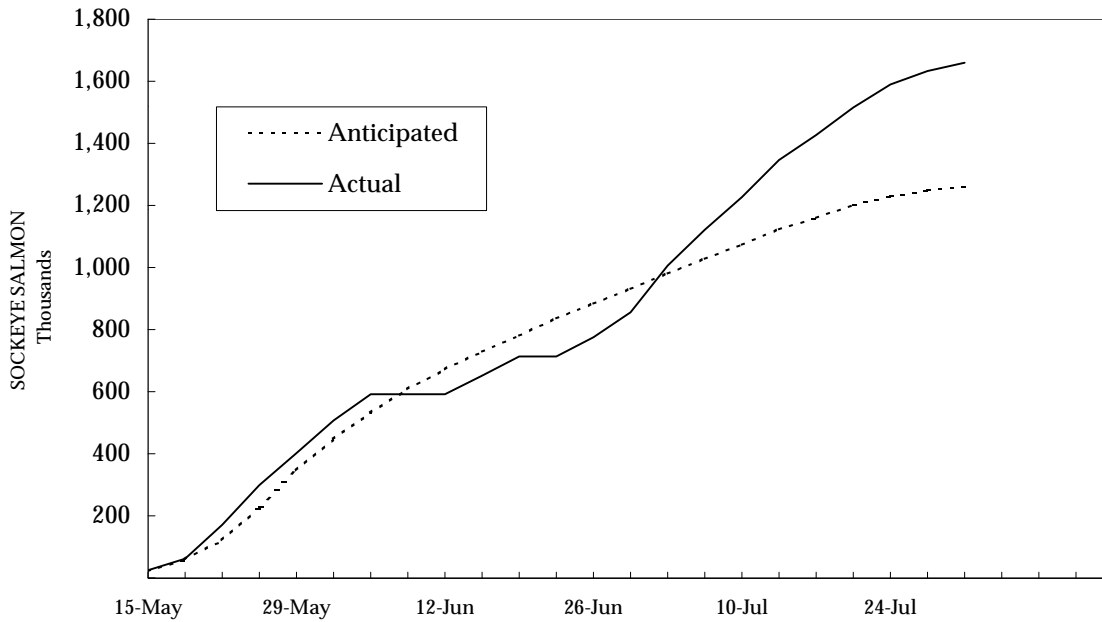
^b Based on historical escapements at Miles Lake sonar, includes upriver chinook escapement component and sockeye broodstock for the Gulkana Hatchery. Does not include sockeye escapements for the Copper/Bering delta streams.

^c Escapement estimate from sonar counters at Miles Lake. Sonar counts ended August 3

COPPER RIVER DISTRICT COMMERCIAL SOCKEYE HARVEST, 1999
Semi-weekly Harvest



Cumulative Harvest



Appendix B.3. Anticipated versus actual semi-weekly and cumulative harvest of sockeye salmon in the Copper River drift gillnet fishery, 1999.

Appendix B.4. Commercial salmon harvest by period in the Copper District drift gillnet fishery, 1999.

Period	Date ^{a,b}	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
01	05/14	12	471	579	7,659	167,520	24,439	145,914	0	0	0	0	341	2,499
02	05/17	12	487	583	8,039	178,199	37,804	225,213	0	0	0	0	4,081	28,885
03	05/21	12	442	578	8,165	173,564	109,204	657,491	0	0	0	0	980	7,083
04	05/24	12	492	634	6,999	148,674	126,961	754,760	0	0	0	0	2,683	19,468
05	05/27	24	499	816	10,338	218,827	102,698	614,331	0	0	0	0	765	5,756
06	05/31	24	458	775	11,086	242,062	106,090	640,006	0	0	1	4	1,704	11,938
07	06/04	12	506	606	5,143	112,939	83,850	504,991	1	8	0	0	534	4,107
08	06/14	12	360	432	2,064	44,471	60,120	370,853	14	97	0	0	629	4,737
09	06/18	12	423	481	1,473	32,538	63,199	384,497	15	94	4	12	4,422	33,817
10	06/24	24	351	480	501	10,437	60,651	373,923	54	388	16	94	632	5,188
11	06/28	24	362	511	268	5,343	80,914	497,075	99	671	82	345	749	6,072
12	07/01	36	399	852	261	4,720	150,144	912,652	516	3,615	159	649	1,256	10,367
13	07/05	36	357	542	104	1,893	115,377	699,391	108	733	88	340	326	2,621
14	07/08	36	340	629	72	1,250	104,940	624,473	152	1,080	181	666	449	3,958
15	07/12	36	308	608	50	823	120,579	705,637	2,181	15,615	282	1,030	914	7,842
16	07/15	36	313	512	26	384	80,564	472,170	2,076	14,900	1,601	6,195	1,964	16,012
17	07/19	48	290	538	23	256	88,713	525,153	1,559	11,252	996	3,606	916	7,640
18	07/22	48	268	628	23	325	73,413	428,710	1,625	12,011	1,595	5,997	771	6,203
19	07/26	48	223	383	14	189	43,628	248,030	765	4,940	979	3,512	569	4,621
20	07/29	48	164	255	9	104	27,337	156,737	983	6,545	1,244	4,393	366	2,950
21	08/02	36	122	159	4	56	10,773	62,967	597	3,671	766	2,753	63	488
22	08/05	36	63	75	3	24	5,694	33,087	1,623	11,016	1,375	4,542	110	751
23	08/09	24	89	111	2	17	2,370	13,712	5,358	36,792	576	1,896	37	276
24	08/16	24	210	266	7	86	2,083	12,461	22,434	170,841	188	629	44	352
25	08/23	24	238	357	4	69	832	5,177	51,179	425,320	60	190	10	70
26	08/30	24	264	374	0	0	180	1,186	40,568	343,722	11	36	6	37
27	09/16	24	77	85	0	0	2	15	9,168	79,504	0	0	0	0
28	09/23	24	67	70	0	0	0	0	8,776	70,580	1	3	0	0
29	09/30	24	27	32	0	0	0	0	2,620	21,210	0	0	0	0
30	10/07	24	15	15	0	0	0	0	590	4,769	0	0	0	0
Total		816		12,966	62,337	1,344,770	1,682,559	10,070,612	153,061	1,239,374	10,205	36,892	25,321	193,738
Average Weight						21.57		5.99		8.10		3.62		7.65

^aStarting date of period.

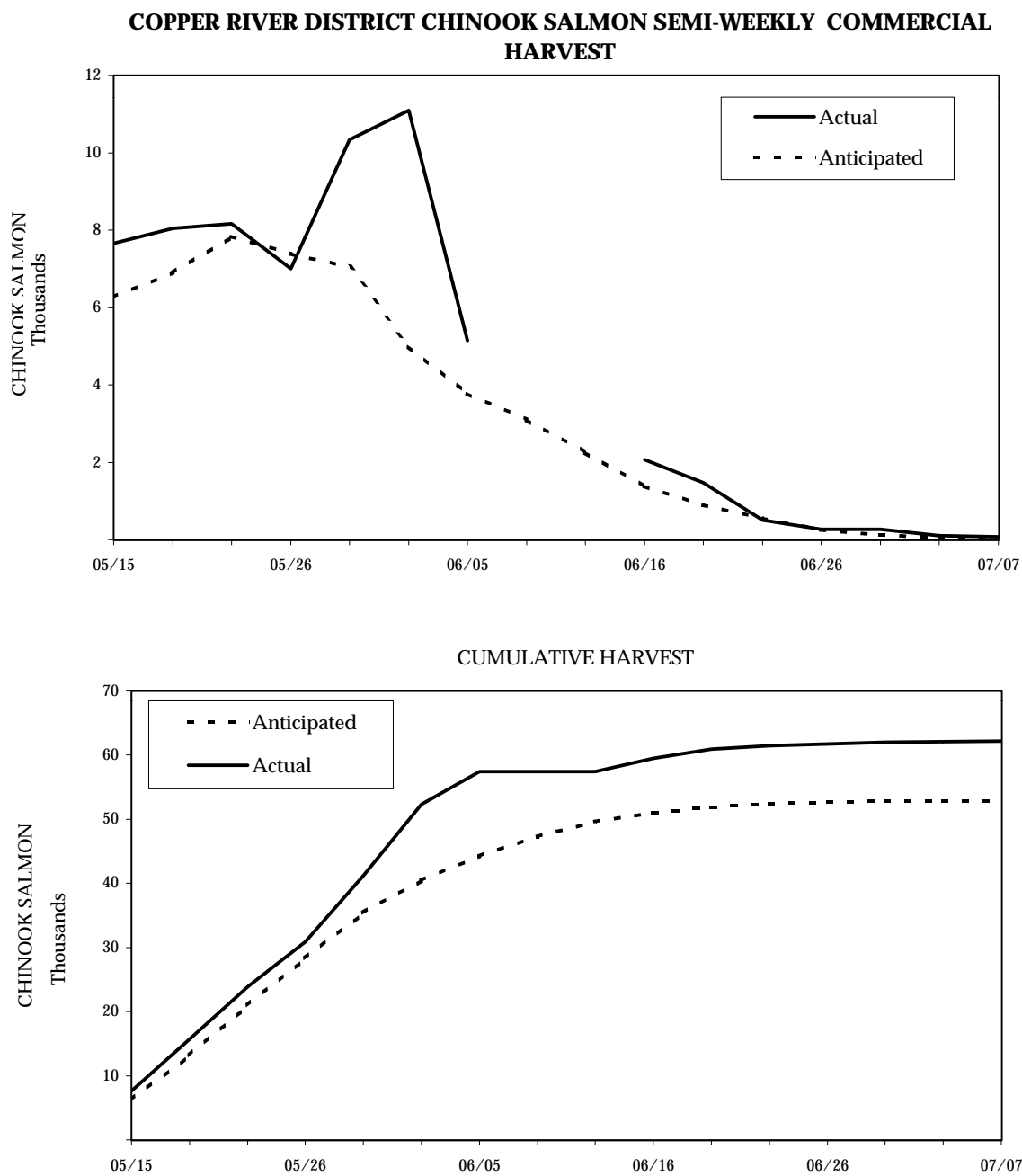
^bFrom 5/14- 8/07 all 24-hour periods started at either 7:00 a.m. or 7:00 p.m. all 12-hour periods began at 7:00 a.m. After August 7 periods began at 12:00 noon.

Appendix B.5. Anticipated and actual weekly catch of chinook and coho salmon in the Copper River District drift gillnet fishery, 1999.

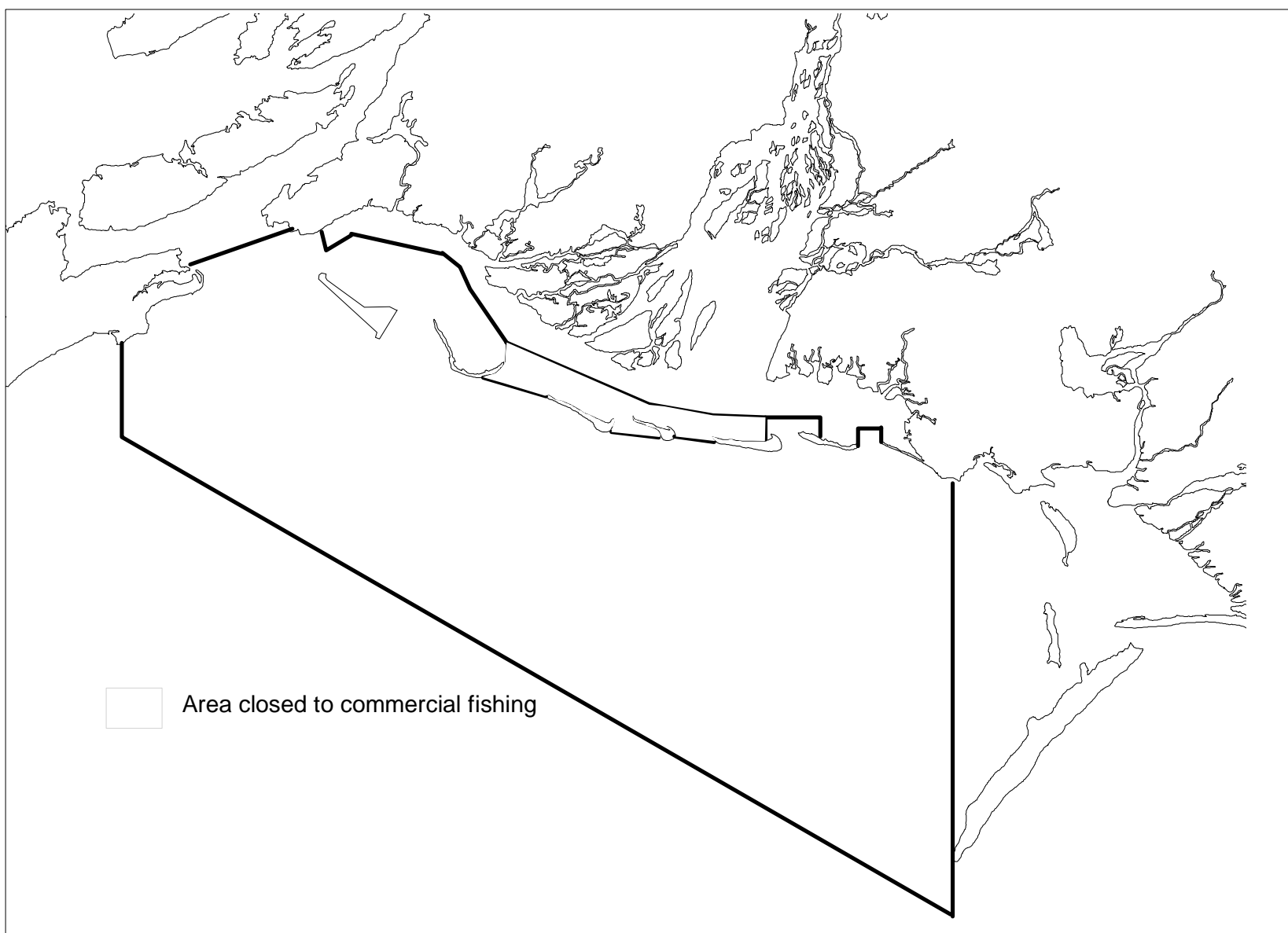
Week Ending Date	Length of Fishing Periods (Hrs)	Chinook		Coho	
		Actual Catch	Anticipated Catch ^a	Actual Catch	Anticipated Catch ^a
15-May	12	7,659	6,276		
22-May	12 and 12	16,204	14,741		
29-May	12 and 24	17,337	14,437		
5-Jun	24 and 12	16,229	8,776	1	13
12-Jun	0 and 0	0	5,363	0	43
19-Jun	12 and 12	3,537	2,280	29	93
26-Jun	24	501	798	54	209
3-Jul	24 and 36	529	178	615	226
10-Jul	36 and 36	176	61	260	534
17-Jul	36 and 36	76	40	4,257	823
24-Jul	48 and 48	46	24	3,184	1,474
31-Jul	48 and 48	23	8	1,748	3,038
7-Aug	36 and 36	7		2,220	10,081
14-Aug	24	2		5,358	21,365
21-Aug	24	7		22,434	44,177
28-Aug	24	4		51,179	63,195
4-Sep	24	0		40,568	65,222
11-Sep	0	0			54,264
18-Sep	24	0		9,168	25,033
25-Sep	24	0		8,776	11,025
2-Oct	24	0		2,620	2,410
9-Oct	24	0		590	736
16-Oct					18
Season Total	816	62,337	52,982	153,061	303,979

^a Based on average historic catches for comparable dates (1969 - 1993).

^b The anticipated cumulative harvest through July 18.



Appendix B.6. Anticipated versus actual semi- weekly and cumulative harvest of chinook salmon in the Copper River drift gillnet fishery, 1999.



Appendix B.7. Copper River District area closed to chinook salmon harvest during the first fishing period, 1999.

Appendix B.8. Daily sockeye salmon escapement estimates at Miles Lake sonar, 1999.

Date	Water Level ^a	Estimated Daily Escapement				Escapement Objective		0600 Count	Projected Daily
		North Bank	South Bank	Daily	Cumulative	Daily	Cumulative		
15-May									
16-May									
17-May						343	343		
18-May						821	1,164		
19-May						1,154	2,318		
20-May						1,312	3,630		
21-May						1,326	4,956		
22-May	39.45					1,825	6,781		
23-May	39.34	48 ^b	912 ^c	960	960	2,689	9,470		
24-May	39.35	24	456 ^c	480	1,440	4,112	13,582		
25-May	39.43	29	571 ^c	600	2,040	4,261	17,843		
26-May	39.44	18	354 ^d	372	2,412	4,541	22,384		
27-May	39.46	41	818	859	3,271	6,492	28,877	196	784
28-May	39.44	54	1,075	1,129	4,400	8,486	37,363	134	536
29-May	39.53	189	2,268	2,457	6,857	6,139	43,502	250	1,000
30-May	39.54	295	5,899	6,194	13,051	7,242	50,745	1082	4,328
31-May	39.42	172	3,438	3,610	16,661	9,504	60,249	998	3,992
01-Jun	39.37	105	2,095	2,200	18,861	10,030	70,279	838	3,352
02-Jun	39.55	94	1,870	1,964	20,825	11,446	81,725	416	1,664
03-Jun	39.55	117	2,349	2,466	23,291	10,939	92,663	638	2,552
04-Jun	39.56	122	2,440	2,562	25,853	12,560	105,223	719	2,876
05-Jun	39.65	135	2,700	2,835	28,688	13,840	119,063	286	1,144
06-Jun	39.87	87	1,740	1,827	30,515	12,501	131,564	725	2,900
07-Jun	40.13	235	6,224	6,459	36,974	12,223	143,788	1,076	4,304
08-Jun	40.52	346	6,924	7,270	44,244	14,382	158,170	1,702	6,808
09-Jun	40.84	441	8,829	9,270	53,514	13,653	171,822	1,163	4,652
10-Jun	41.16	707	14,146	14,853	68,367	13,101	184,923	1,900	7,600
11-Jun	41.37	1,289	25,774 ^e	27,063	95,430	12,614	197,537	6,604	26,416
12-Jun	41.45	1,261	25,224	26,485	121,915	11,749	209,286	6,571	26,284
13-Jun	41.64	240	24,632	24,872	146,787	10,225	219,511	6,918	27,672
14-Jun	41.96	934	18,688	19,622	166,409	9,739	229,250	5,620	22,480
15-Jun	42.19	819	16,377	17,196	183,605	10,587	239,838	5,973	23,892
16-Jun	42.35	895	17,907	18,802	202,407	9,507	249,345	2,962	18,220
17-Jun	42.50	500	15,521	16,021	218,428	9,437	258,782	4,555	9,812
18-Jun	42.66	481	10,179	10,660	229,088	8,181	266,963	2,453	11,500
19-Jun	42.83	638	12,369	13,007	242,095	7,441	274,404	2,875	13,000
20-Jun	42.73	1,180	13,516	14,696	256,791	7,624	282,027	3,250	11,964
21-Jun	42.62	1,622	12,480	14,102	270,893	6,899	288,926	2,991	15,972
22-Jun	42.42	519	14,226	14,745	285,638	7,385	296,311	3,993	15,972
23-Jun	42.26	330	9,938	10,268	295,906	7,822	304,133	2,991	11,964
24-Jun	42.12	164	16,751	16,915	312,821	7,499	311,631	4,515	18,060
25-Jun	42.07	196	13,844	14,040	326,861	7,606	319,237	3,426	13,704
26-Jun	42.20	207	14,944	15,151	342,012	7,078	326,315	3,718	14,872
27-Jun	42.37	399	20,146	20,545	362,557	6,890	333,205	4,548	18,192
28-Jun	42.32	576	14,391	14,967	377,524	6,621	339,826	3,484	13,936
29-Jun	42.27	527	14,314	14,841	392,365	8,034	347,860	2,434	9,736
30-Jun	42.34	328	14,178	14,506	406,871	8,333	356,193	3,117	12,468

-Continued-

Appendix B.8. (page 2 of 2)

Date	Water Level ^a	Estimated Daily Escapement				Escapement Objective		0600 Count	Projected Daily
		North Bank	South Bank	Daily	Cumulative	Daily	Cumulative		
01-Jul	42.38	314	15,753	16,067	422,938	8,621	364,814	3,351	13,404
02-Jul	42.47	134	10,810	10,944	433,882	9,784	374,598	2,520	10,080
03-Jul	42.59	87	12,926	13,013	446,895	11,049	385,647	3,016	12,064
04-Jul	42.87	104	10,102	10,206	457,101	11,705	397,352	2,555	10,220
05-Jul	43.10	55	9,161	9,216	466,317	12,818	410,170	3,057	12,228
06-Jul	43.19	120	6,744	6,864	473,181	12,645	422,815	1,659	6,636
07-Jul	43.09	247	6,449	6,696	479,877	12,684	435,498	1,489	5,956
08-Jul	43.00	340	16,000	16,340	496,217	13,789	449,288	2,412	9,648
09-Jul	42.95	404	13,973	14,377	510,594	15,581	464,869	3,123	12,492
10-Jul	42.85	395	15,204	15,599	526,193	15,263	480,132	3,298	13,192
11-Jul	42.73	334	16,785	17,119	543,312	15,428	495,560	3,817	15,268
12-Jul	42.78	393	12,656	13,049	556,361	14,792	510,352	3,729	14,916
13-Jul	42.85	411	9,831	10,242	566,603	15,598	525,950	2,620	10,480
14-Jul	42.86	586	16,135	16,721	583,324	14,400	540,350	2,139	8,556
15-Jul	42.78	680	16,869	17,549	600,873	13,575	553,925	3,749	14,996
16-Jul	43.07	397	17,835	18,232	619,105	15,439	569,364	3,758	15,032
17-Jul	43.41	609	16,032	16,641	635,746	15,192	584,556	3,824	15,296
18-Jul	43.43	634	10,790	11,424	647,170	13,192	597,747	3,258	13,032
19-Jul	43.29	1,265	14,030	15,295	662,465	12,961	610,709	1,885	7,540
20-Jul	42.93	2,522	13,555	16,077	678,542	14,284	624,993	2,519	10,076
21-Jul	42.93	1,732	14,666	16,398	694,940	10,876	635,869	3,513	14,052
22-Jul	42.96	665	7,862	8,527	703,467	9,131	645,000	2,195	8,780
23-Jul	42.96	1,294	17,924	19,218	722,685	8,355	653,355	1,720	6,880
24-Jul	42.52	1,241	15,256	16,497	739,182	8,632	661,987	2,904	11,616
25-Jul	42.29	766	15,815	16,581	755,763	7,610	669,596	4,030	16,120
26-Jul	42.13	885	13,303	14,188	769,951	6,768	676,364	3,261	13,044
27-Jul	42.13	876	7,745	8,621	778,572	7,115	683,480	2,324	9,296
28-Jul	42.34	1,130	8,519	9,649	788,221	7,731	691,210	2,761	11,044
29-Jul	42.50	1,517	8,974	10,491	798,712	7,096	698,306	1,871	7,484
30-Jul	42.59	1,709	11,504	13,213	811,925	5,937	704,243	2,456	9,824
31-Jul	42.41	1,259	6,715	7,974	819,899	5,792	710,035	1,944	7,776
01-Aug	42.48	2,447	10,592	13,039	832,938	5,383	715,419	2,030	8,120
02-Aug	42.70	2,030 ^f	8,501	10,531	843,469	4,539	719,958	2,496	9,984
03-Aug	43.17		7,482	7,482	850,951	3,960	723,918	1,597	6,388
04-Aug	43.46					4,032	727,950		

a Meters above sea level.

b North bank tripod was deployed.

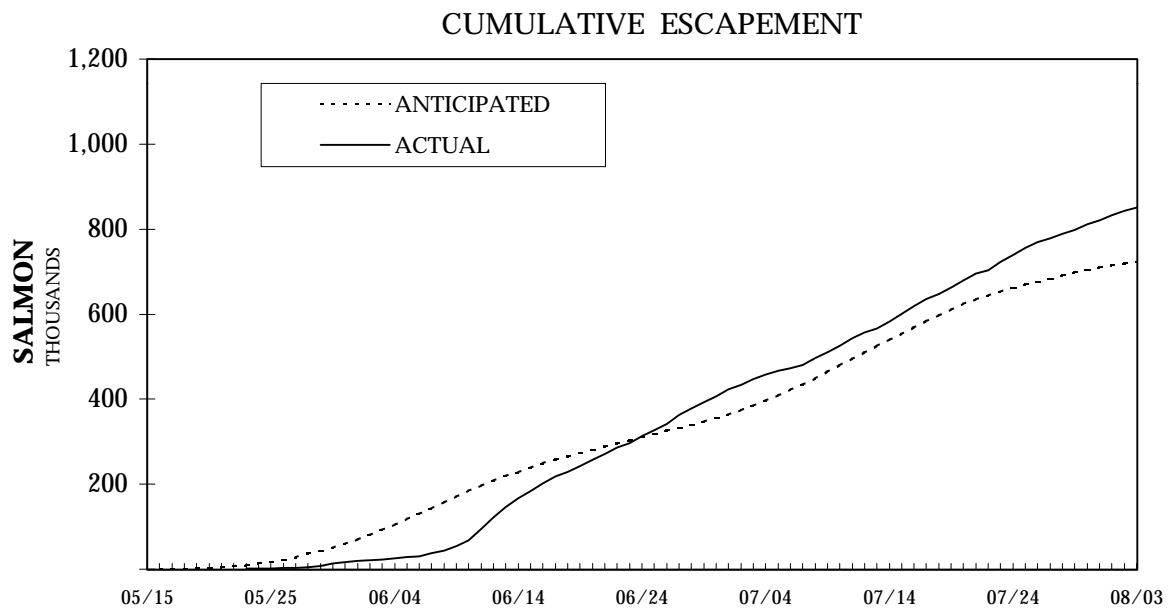
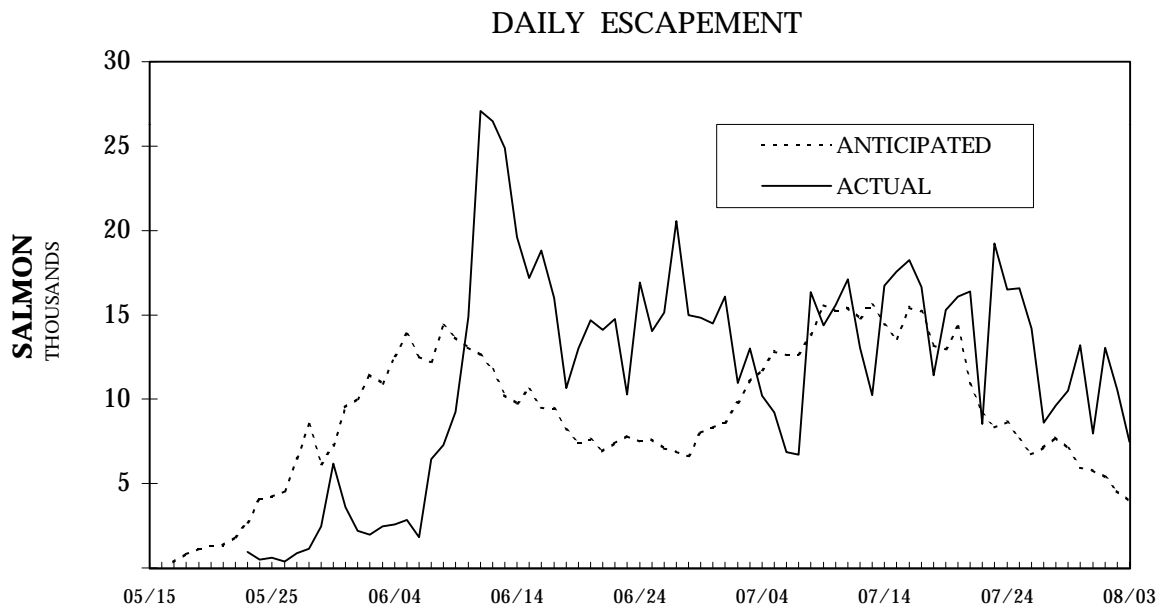
c North bank counts are derived from an average of five percent of north bank counts versus south bank counts based on past performance from 1988-1993.

d South bank transducer was deployed on the tripod

e South bank transducer was deployed on the permanent substrate at midnight.

f North banks counter was pulled at 12:00 midnight.

1999 MILES LAKE SONAR COUNTS



Appendix B.9. Anticipated versus actual daily and cumulative salmon escapement, Miles Lake sonar, 1999.

Appendix B.10. Aerial escapement indices by date and location for sockeye salmon returning to the Copper River Delta, 1999.

Copper River Delta ^a		Aerial Escapement Indices by Survey Date						
System and Drainage	Survey System	June 4	June 11	June 18	June 26	July 2	July 9	July 16
Eyak River	Eyak River	0	40	10	2,000	3,000	350	1,000
	West Shore Beaches	0	0	60	0	5,900	7,000	3,000
	East Shore Beaches	0	0	0	2,000	3,000	1,500	4,000
	Middle Arm Beaches ^b	25	270	85	230	300	2,600	4,000
	North Shore Beaches	0	0	0	0	200	500	350
	Hatchery Creek Delta	0	0	0	140	350	500	800
	Hatchery Creek	0	0	0	40	400	800	600
	Power Creek Delta	0	0	0	0	1,850	1,500	1,200
	Power Creek	0	0	0	0	0	350	1,000
Ibek Creek	Ibek Creek	0	NS	NS	NS	NS	NS	NS
Alaganik Slough	Alaganik Slough	0	2	NS	0	0	NS	NS
	McKinley Lake	0	200	0	0	2,800	1,800	1,200
	Salmon Creek West For	0	0	0	0	0	20	2,900
	Salmon Creek East For	0	0	0	0	0	0	900
26/27 Mile Creek	26/27 Mile Creek	0	0	420	280	3,800 *	3,500	1,800
39 Mile Creek	39 Mile Creek	0	0	6	520	300	310	1,220
Goat Mountain	Goat Mountain Creek	0	0	0	0	0	NC	0
Pleasant Creek	Pleasant Creek	0	350	391	3,900	7,615 *	1,850	600
Martin River	Martin River - Lower	0	1,440	730	851	2,375	7,520	4,670
	Ragged Point River	0	20	70	0	0	0	0
	Ragged Point Lake Out	0	0	0	0	0	0	NS
	Ragged Point Lake	0	NS	1	0	0	0	NS
	Martin River - Upper ^c	0	700	850	410	810	790	800
	Martin Lake Outlet	0	0	0	1,000	500	200	800
	Martin Lake	0	NS	0	4,500	14,800	18,100	9,150
	Martin Lake Feeders	0	NS	NS	0	200	850	6,000
	Pothole River	0	NS	NS	0	180	600	1,100
	Pothole Lake	0	NS	NS	0	0	0	30
Tokun	Little Martin River	0	0	430	185	420	700	700
	Little Martin Lake	0	0	0	0	20	0	0
	Tokun Springs	0	0	0	0	0	350	300
	Tokun River	0	60	10	25	360	600	420
	Tokun Lake Outlet	0	125	300	2,300	1,000	700	1,050
	Tokun Lake	0	0	0	0	2,000	20	0
Martin River Slough		0	0	5,010	8,500	8,800	10,900 *	6,400
Copper River Aerial Survey Daily Total		25	3,207	8,373	26,881	60,980	63,910	55,990
Anticipated Escapement		3,732	8,082	20,251	25,752	41,075	44,893	50,540

-Continued-

Appendix B.10. (page 2 of 4).

Copper River Delta ^a		Aerial Escapement Indices by Survey Date						
System and Drainage	Survey System	July 28	August 3	August 10	August 17	August 25	Sept. 8	Sept. 28
Eyak River	Eyak River	2,000	2,800	1,000 *	300	100	NC	0
	West Shore Beaches	1,750	1,700	5,000 *	1,400	2,500	1,400	800
	East Shore Beaches	4,600	2,200	1,400 *	1,330	2,800	150	50
	Middle Arm Beaches ^b	5,800	6,000	7,500 *	3,400	4,000	4,600	250
	North Shore Beaches	600	230	2,000 *	500	500	600	30
	Hatchery Creek Delta	380	100	400 *	400	400	150	0
	Hatchery Creek	500	200	200 *	300	100	300	200
	Power Creek Delta	2,100	150	800 *	300	150	100	50
	Power Creek	850	1,400 *	500	300	80	10	400
Ibek Creek	Ibek Creek	25	22	0	0	50	0	0
Alaganik Slough	Alaganik Slough	NS	NS	0	NS	NS	0	0
	McKinley Lake	3,050	2,280	1,800	380	400 *	400	250
	Salmon Creek West For	4,000	4,000	3,000	4,000	4,100 *	2,000	200
	Salmon Creek East For	500	450	3,000	1,520	3,000 *	1,500	100
26/27 Mile Creek	26/27 Mile Creek	2,500	2,100	3,000	1,200	650	550	400
39 Mile Creek	39 Mile Creek	12,000 *	8,000	6,000	6,000	6,000	3,000	2,500
Goat Mountain	Goat Mountain Creek	NS	0	0	0	0	0	60
Pleasant Creek	Pleasant Creek	200	30	200	0	0	0	0
Martin River	Martin River - Lower	8,475	1,990	100	1,100 *	0	0	0
	Ragged Point River	82	4,600	8,200	1,900 *	1,000	50	0
	Ragged Point Lake Out	0	400	900	1,500 *	800	400	40
	Ragged Point Lake	0	180	200	2,500 *	2,500	4,000	1,000
	Martin River - Upper ^b	1,700 *	710	350	500	48	0	0
	Martin Lake Outlet	100	2,000	400	2,000 *	0	200	0
	Martin Lake	4,000 *	1,700	1,550	820	100	120	0
	Martin Lake Feeders	8,000 *	6,100	6,000	1,600	0	0	0
	Pothole River	500	600	300	250	0	100 *	0
	Pothole Lake	20	50	0	900	2,000 *	1,200	400
	Little Martin River	0	100	600 *	600	200	0	0
	Little Martin Lake	850	650	1,200 *	700	400	150	40
Tokun	Tokun Springs	1,600	2,400 *	1,400	700	0	0	0
	Tokun River	900	900	750	1,300 *	420	100	0
	Tokun Lake Outlet	300	0	0	500 *	50	0	0
	Tokun Lake	3,100	320	1,200	3,400 *	600	5,000	400
Martin River Slough	Martin River Slough	4,700	3,300	3,200	1,700	220	0	0
Copper River Aerial Survey Daily Total		75,182	57,662	62,150	43,300	33,168	26,080	7,170
Anticipated Escapement		52,055	42,500	41,500	40,100	31,660	20,413	7,305

-Continued-

Appendix B.10. (page 3 of 4).

Copper River Delta ^b		Estimated Escapement		
System and Drainage	Survey System	Site ^c	System ^e	Anticipated
Eyak River	Eyak River	1,000	19,700	14,500
	West Shore Beaches	5,000		
	East Shore Beaches	1,400		
	Middle Arm Beaches ^b	7,500		
	North Shore Beaches	2,000		
	Hatchery Creek Delta	400		
	Hatchery Creek	200		
	Power Creek Delta	800		
	Power Creek	1,400		
Ibek Creek	Ibek Creek	50	50	
Alaganik Slough	Alaganik Slough	0	7,500	13,800
	McKinley Lake	400		
	Salmon Creek W Fork	4,100		
	Salmon Creek E Fork	3,000		
26/27 Mile Creek	26/27 Mile Creek	3,800	3,800	3,650
39 Mile Creek	39 Mile Creek	12,000	12,000	9,400
Goat Mountain	Goat Mountain Creek	60 +	60	1,000
Pleasant Creek	Pleasant Creek	7,615	7,615	950
Martin River	Martin River - Lower	1,100	31,750	29,800
	Ragged Point River	1,900		
	Ragged Point Outlet	1,500		
	Ragged Point Lake	2,500		
	Martin River - Upper ^b	1,700		
	Martin Lake Outlet	200		
	Martin Lake	18,100		
	Martin Lake Feeders	850		
	Pothole River	100		
	Pothole Lake	2,000		
	Little Martin River	600		
	Little Martin Lake	1,200		
Tokun	Tokun Springs	2,400	7,600	9,350
	Tokun River	1,300		
	Tokun Lake Outlet	500		
	Tokun Lake	3,400		
Martin River Slough	Martin River Slough	10,900	10,900	6,600
Copper River Aerial Survey Daily Total			100,975	
Anticipated Escapement Index				89,050

-Continued-

Appendix B.10. (page 4 of 4).

- ^a The survey sites represent most of the known sockeye salmon spawning locations in the Copper River Delta drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, run timing at spawning sites, and relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks, but have been used for that purpose in the absence of any other escapement estimating method. The abbreviations used in the table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate seen in less than ideal conditions. The symbol * indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote b).
- ^b The sites typically have very protracted run timing or two temporally segregated spawning populations. Aerial counts from more than one day may be combined and used in the escapement estimate if the surveyor indicates that these counts represented different fish.
- ^c The escapement estimate for each site is in the combined survey estimate. Where the survey site is a terminal spawning area, the peak count is used. However, if the site is a schooling area for migratory fish headed further upstream, the count which best minimized the possibility of duplicate counts is used.
- ^d This stream is not included in the estimated escapement delta wide, it is a non-index stream.
- ^e The sum of the estimates by site within a system.

Appendix B.11. Copper River and Bering River area sockeye salmon escapement estimates, 1991 - 1999.

Stream/Lake ^{a,b}	1991	1992	1993	1994	1995	1996	1997	1998	1999
Eyak Lake	20,640	21,470	16,400	18,040	17,720	16,110	^d	16,300	18,100
Hatchery Creek	5,100	2,200	1,100	2,800	3,700	1,900	^d	3,300	200
Power Creek	1,870	1,420	700	500	650	1,200	^d	1,500	1,400
Ibek Creek	120	40	^d	800	^d	100	^d	^d	50
McKinley Lake	2,000	10,300	7,700	12,700	13,100	8,600	8,500	11,300	400
Salmon Creek	3,330	25	3,000	420	200	2,600	3,100	3,300	7,100
26/27 Mile Creek	3,900	1,420	1,625	4,900	2,000	1,440	1,700	1,800	3,800
39 Mile Creek	5,340	4,500	4,000	7,000	5,400	6,200	9,300	11,500	12,000
Goat Mountain	20	620	^d	600	650	1,000	350	300	60
Pleasant Creek	1,495	1,567	2,270	1,400	1,600	1,400	5,000	1,000	7,615
Martin River	2,045	1,400	1,500	4,700	1,500	2,700	1,100	2,700	2,800
Ragged Pt. R./Lake	5,900	2,600	1,325	0	6,200	1,540	4,400	4,800	5,900
Martin Lake	10,700	14,000	6,700	13,100	9,450	9,000	13,100	13,600	19,150
Pothole Lake	5,200	1,300	700	950	1,200	1,160	300	1,500	2,100
L. Martin Lake	11,700	1,780	1,900	1,760	2,500	300	470	750	1,800
Tokun Lake/River	5,960	8,230	3,400	2,850	7,150	7,150	5,750	8,950	7,600
Martin River Slough	5,180	3,955	5,400	5,850	3,350	3,070	4,000	4,900	10,900
Copper Delta Total	90,500	76,827	57,720	78,370	76,370	65,470	57,070	87,500	100,975
Upper Copper R. ^c	579,412	601,952	833,387	715,577	599,265	906,239	1,148,079	866,957	850,951
Copper R. Dist. Tot.	669,912	678,779	891,107	793,947	675,635	971,709	1,205,149	954,457	951,926
Bering River/Lake	26,480	54,180	23,120	23,000	28,650	22,420	^d	21,600	39,030
Shepherd Creek	3,400	1,200	3,100	1,400	2,600	2,000	1,400	^d	1,215
Stillwater Cr.	1,200	150	500	800	900	1,100	700	400	950
Kushtaka Lake	880	100	205	150	400	990	65	500	1,100
Katalla River	260	265	800	1,200	900	800	700	900	3,900
Bering R. Area Tot.	32,220	55,895	27,725	26,550	33,450	27,310	2,865	23,400	46,195
Copper/Bering Total	702,132	734,674	918,832	820,497	709,085	999,019	1,208,014	977,857	998,121

^a The escapement figures in this table are based on peak aerial survey estimates and sonar counts from a majority of known salmon spawning areas in the Copper and Bering River Delta. These indices are not intended to provide a true estimate of total escapement for the coastal stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimates across years.

^b The areas in this table represent combined survey sites corresponding to the "system" designations for the current year survey results presented elsewhere in this report.

^c Upriver escapement estimate from Miles Lake sonar counts.

^d Peak escapement estimates were not possible for these systems due to poor weather conditions.

Appendix B.12. Aerial survey indices of chinook salmon escapement to the upper Copper River, 1990 - 1998.

Location ^a	Yearly Survey Indices									10 Year Average 1985- 1994
	1991	1992 ^b	1993	1994	1995 ^b	1996	1997	1998	1,999	
East Fork Chistochina	865			508		2,050	2,245	740		582
Gulkana River	1,303		1,156	1,682		2,321	2,250	1,407		1,384
Mendeltna Creek	305		126	121		370	350	280		127
Kiana Creek	520		65	430		723	455	700		260
St. Anne Creek	115			250		117	900	515		107
Manker Creek	101			75		192	466	828		103
Grayling Creek	151			2		164	330	527		94
Little Tonsina River	54			4		45	55	NC		137
Indian River	18			47		207	270	48		18
Total Survey Index	#REF!	3,432	0	1,347		0	6,189	7,321	5,045	2,812

^a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known spawning areas in the upper Copper River drainage. These indices are not intended to provide a true estimate of total escapement for these stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however counts were obtained only as environmental conditions allowed and may not necessarily correspond to periods of peak abundance. Missing counts are generally a result of bad weather, high water or other factors that prevent surveys for that given year.

^b Due to poor weather conditions surveys were conducted late and are not comparable.

Appendix B.13. Aerial survey indices of sockeye salmon escapement to the upper Copper River drainage, 1991 - 2000.

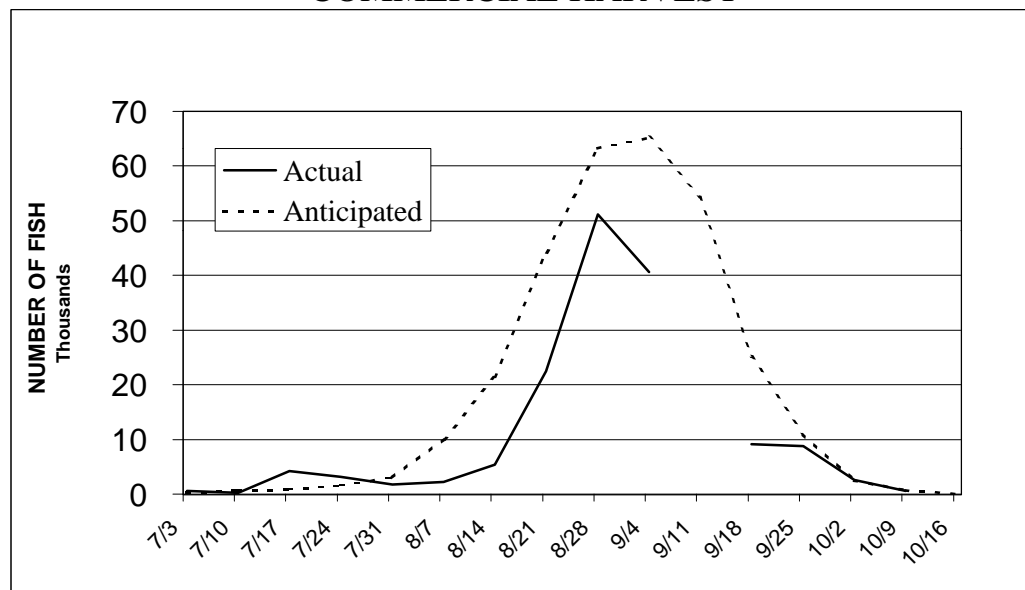
Location ^a	Year survey Indices										10 Year Average 1983-92
	1991	1992	1993 ^c	1994 ^c	1995 ^c	1996	1997	1998	1999	2000	
Fish Lake	4,350	4,250				4,800		4,900	1,880	5,000	6,418
Bad Crossing 1&2	2,625	500				780		7,800	195	19	2,604
Suslota Lake	210	1,350				4,100		1,060	0	3,000	1,416
Dickey Lake	56	46				0		350	11	0	115
Keg Creek	95	630				850	420	160	125	0	725
Mahlo Creek	3,750	250				3,800	11,800	12,300	325	1,000	2,648
St. Anne Creek	4,700	450				3,500	4,800	4,100	1,300	1,100	4,888
Fish Cr.-Mentasta	1,050	480				400		1,400	450	800	963
Swede Lake	110	875				20		770	270	135	531
Tana River	750	740									1,345
Mentasta Lake	1,550	600				2,800		6,100	715	1,200	3,277
Tanada Lake	1,725	2,250		6,270	3,100				350	3,200	3,849
Salmon Creek	350	1,500							0	500	825
Paxson Inlt-Mud Cr	4,800	6,450				16,800		15,200	5,700	2,200	6,560
Mud Creek and Lake	100	425				240			20	30	172
Mendeltna Creek	3,050	1,750				1,250	400		120	2,800	2,470
Paxson Lake Outlet	2,300	950						200	1,800	1,000	2,661
Mud Cr.- Summit L.	9,625	3,800						700	820	140	7,445
Long Lake	^b	1,050									1,577
Tonsina Lake	^b	1,350									1,080
Totals	41,196	29,696									51,569

a The escapement figures in this table are based on peak aerial survey estimates and weir counts from a majority of the known spawning areas in the upper Copper River drainage. These indices are not intended to provide a true estimate of total escapement for these stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimate across years, however counts were obtained only as environmental conditions allowed and may not necessarily correspond to periods of peak abundance. Missing counts are generally a result of bad weather, high water or other factors that prevent surveys for that given year.

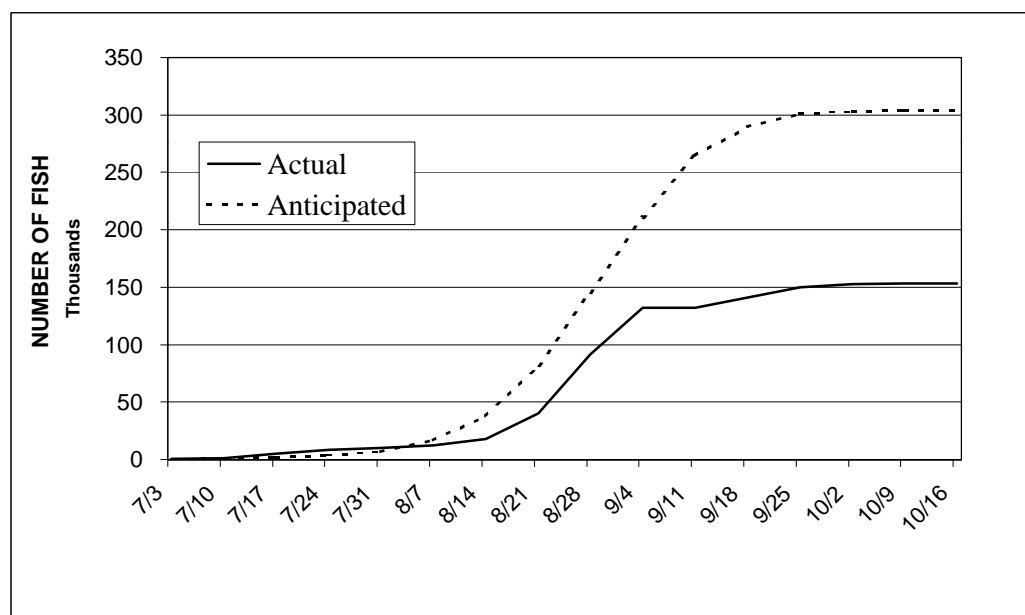
b No survey flown.

c The Tanada Lake system was the only system surveyed in 1994 and 1995, no surveys were flown in 1993.

COPPER RIVER DISTRICT COHO SALMON WEEKLY COMMERCIAL HARVEST



CUMULATIVE COHO SALMON HARVEST



Appendix B.14. Anticipated weekly and cumulative harvest of coho salmon versus actual
Copper River drift gillnet fishery, 1999.

Appendix B.15. Aerial escapement indices by date and location for coho salmon returning to the Copper River Delta, 1999.

Copper River Delta ^a		Aerial Escapement Indices by Survey Date ^b				
System and Drainage	Survey System	August 11	August 17	August 25	Sept. 08	Sept. 28
Eyak River	Eyak River	300	200	400 *	NC	NC
	East Shore Beaches	0	0	0	0	0 *
	West Shore Beaches	0	0	0	30	150 *
	Middle Arm Beaches	0	0	0	50	1,100 *
	North Shore Beaches	0	0	0	20	0 *
	Hatchery Creek Delta	0	0	0	400	150 *
	Hatchery Creek	0	0	0	0	150 *
	Power Creek Delta	0	0	0	800	1,100 *
	Power Creek	0	0	0	280	1,600 *
Ibek Creek	Ibek Creek	20	NC	150	570	4,600 *
Scott River	Scott River ^c	NC	NC	10	0	2,100 *
	Elsner Lake ^c	0	0	0	2	300 *
	Scott Lake ^c	0	0	30	20	100 *
Alaganik Slough	Alaganik Slough	NS	NS	NS	20 *	NS
	18/20 Mile Creek	0	0	0	270	610 *
	McKinley Lake	0	0	0	0	50 *
	Salmon Creek West Fork	100	0	0	300	1,500 *
	Salmon Creek East Fork	0	0	0	140	1,580 *
26/27 Mile Creek	26/27 Mile Creek	80	5	0	920	2,610 *
39 Mile Creek	39 Mile Creek	200	200	100	1,000	3,650 *
Goat Mountain Cr.	Goat Mountain Creek	0	4	0	450	650 *
Pleasant Creek	Pleasant Creek ^c	0	0	0	50	1,220 *
Martin River	Martin River - Lower	267	100	1,510	410	1,900 *
	Ragged Point River	0	0	80	50	250 *
	Ragged Point Lake Outlet	0	0	0	0	25 *
	Ragged Point Lake	0	0	0	0	0 *
	Martin River - Upper	20	150	480	290	2,000 *
	Martin Lake Outlet	0	0	600	60 *	0
	Martin Lake	0	0	0	640 *	0
	Martin Lake Feeders	0	0	0	0 *	0
	Pothole River	90	0	600 *	50	60
	Pothole Lake	0	0	0 *	400	190
	Little Martin River	550	220	50	1,900	3,600 *
	Little Martin Lake	0	0	0	0	0 *
	Tokun Springs	0	0	60	400	700 *
	Tokun River	100	0	10	90	430 *
	Tokun Lake Outlet	0	0	0	0	0 *
	Tokun Lake	0	0	0	0	0 *
Martin River Slough	Martin River Slough	225	40	285	8,500	12,900 *
Copper River Aerial Survey Daily Total		1,952	919	4,365	18,112	45,275
Anticipated Escapement^b		4,400	6,200	12,200	42,000	32,983

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Appendix B.15. (page 2 of 3)

Copper River Delta ^a		Estimated Escapement		
System and Drainage	Survey System	Site ^d	System ^e	Anticipated
Eyak River	Eyak River	400	4,650	6,100
	East Shore Beaches	0		
	West Shore Beaches	150		
	Middle Arm Beaches	1,100		
	North Shore Beaches	0		
	Hatchery Creek Delta	150		
	Hatchery Creek	150		
	Power Creek Delta	1,100		
	Power Creek	1,600		
Ibek Creek	Ibek Creek	4,600	4,600	6,600
Scott River	Scott River ^c	2,100	2,500	
	Elsner Lake ^c	300		
	Scott Lake ^c	100		
Alaganik Slough	Alaganik Slough	20		
	18/20 Mile Creek	610	660	1,000
	McKinley Lake	50		
	Salmon Creek West Fork	1,500	3,080	2,500
	Salmon Creek East Fork	1,580		
26/27 Mile Creek	26/27 Mile Creek	2,610	2,610	400
39 Mile Creek	39 Mile Creek	3,650	3,650	3,800
Goat Mountain Cr.	Goat Mountain Creek	650	650	1,350
Pleasant Creek	Pleasant Creek ^c	1,220		
Martin River	Martin River - Lower	1,900	3,900	5,700
	Ragged Point River	250	275	1,200
	Ragged Point Lake Outlet	25		
	Ragged Point Lake	0		
	Martin River - Upper	2,000		
	Martin Lake Outlet	600	600	1,950
	Martin Lake	0		
	Martin Lake Feeders	0		
	Pothole River	600	600	2,350
	Pothole Lake	0		
	Little Martin River	3,600	3,600	6,000
	Little Martin Lake	0		
	Tokun Springs	700	1,130	1,100
	Tokun River	430		
	Tokun Lake Outlet	0		
	Tokun Lake	0		
Martin River Slough	Martin River Slough	12,900	12,900	9,200
Copper River Aerial Survey Total			45,405	
Anticipated Escapement ^a				49,250

-continued-

Appendix B.15. (page 3 of 3)

- ^a The survey sites represent most of the known coho salmon spawning locations in the Copper River Delta drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but have been used for that purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate seen in less than ideal conditions. The symbol * indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote d).
- ^b For systems not flown on any given survey the expected for that system was subtracted from the total anticipated.
- ^c This stream is not included in the estimated escapement delta wide, it is a non-index stream.
- ^d The escapement estimates for each site is in the astricted survey estimate. Where the survey site is a terminal spawning area the peak count is used. However, if the site is a schooling area for migratory fish bound for sites further upstream, the count which minimizes possible duplication of counts across dates is selected.
- ^e The sum of the estimates by site within the index systems.

Appendix B.16. Copper River Delta and Bering River coho salmon escapement estimates, 1991 - 1999.

Stream/Lake ^{a,b}	1991	1992	1993	1994	1995	1996	1997	1998 ^c	1999
Eyak Lake	7,170	5,710	NC ^d	9,900	4,050	5,100	6,800		1,250
Hatchery Creek	0	1,100	NC ^d	700	170	0	1,400		300
Power Creek	0	1,000	NC ^d	700	300	0	2,700		2,700
Ibek Creek	13,540	9,600	NC ^d	3,060	3,000	6,300	4,700		4,600
Scott & Elsner River ^c	700	550	1,580	1,600	540	1,000	2,200		2,500
18/20 Mile	4,200	915	1,750	3,300	2,550	3,800	3,300		610
McKinley Lake	100	800	700	2,100	400	NC ^d	1,100		50
Salmon Creek	1,770	0	1,400	0	1,250	1,500	2,500		3,080
26/27 Mile	300	475	1,500	1,300	1,300	1,480	2,300		2,610
39 Mile	2,100	1,900	1,600	4,150	3,800	5,250	6,100		3,650
Goat Mountain	1,900	480	650	1,000	2,800	1,000	1,400		650
Pleasant Cr. ^c	6	8	NS	45	100	40	620		1,220
Martin River	1,600	1,900	4,540	10,600	5,000	15,400	NC ^d		3,900
Ragged Pt. River/Lk.	450	310	300	0	100	0	80		275
Martin Lake	1,500	65	150	0	10	0	NC ^d		600
Pothole Lake	6,000	300	730	0	300	140	60		600
Little Martin Lake	11,360	10,800	6,400	200	1,500	700	10,500		3,600
Tokun River/Lake	2,800	510	950	1,780	1,900	1,300	1,300		1,130
Martin River Slough	8,860	8,140	11,200	5,120	5,950	4,100	10,500		12,900
Copper Delta Total	64,356	44,563	33,450	45,555	35,020	47,110	57,560		46,225

Katalla R.	4,000	2,760	4,400	4,500	4,500	6,800	8,000		3,000
Bering Lake	12,300	3,540	5,900	5,800	10,600	6,000	14,800		13,800
Dick Creek	1,220	1,250	200	100	100	0	1,300		1,270
Shepherd Cr.	NS	NS	600	900	800	NC ^d	NC ^d		200
Nichawak R.	2,560	1,970	4,100	2,000	2,700	2,000	4,300		4,800
Gandil R.	1,460	600	1,250	950	1,350	1,000	1,900		3,000
Controller Bay	9,760	6,180	13,600	14,300	7,400	11,000	12,100		5,220
Bering Area Total	31,300	16,300	30,050	28,550	27,450	26,800	42,400		31,290

Copper/Bering Total	95,656	60,863	63,500	74,105	62,470	73,910	99,960		77,515
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^a The escapement figures in this table are based on peak aerial survey estimates counts from a majority of the known salmon spawning areas in the Copper and Bering River Delta. These indices are not intended to provide a true estimate of total escapement for the coastal stocks, but a comparable index based upon the best data currently available. An effort has been made to standardize the estimates across years, however counts were obtained only as environmental conditions allowed and may not necessarily correspond to periods of peak abundance. Missing counts are generally a result of bad weather, high water, turbulence or other factors that prevent surveys for that given year.

^b The areas in this table represent combined survey sites corresponding to the "system" designations for the current year survey results presented elsewhere in this report.

^c Not an indexed stream.

^d Due poor stream or weather conditions these systems are listed as "NC" no count. See Appendix B.15. for weekly observations.

^e Due to weather conditions and timing of surveys no peak estimate was possible.

Appendix B.17. Estimated age and sex composition of sockeye salmon harvested in the Copper River District commercial common property drift gillnet fishery, 1999.

		Brood Year and Age Class									Total	
		1996		1995		1994			1993			
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3		3.2
Strata Combined:	05/14 - 10/08											
Sampling dates:	05/15 - 07/28											
Sample size:	5,002											
Female	Percentage of sample	0.0	0.0	2.3	11.2	0.0	29.7	0.7	0.2	2.1	0.0	46.3
	Number in catch	255	0	38,174	189,252	445	499,515	11,654	4,138	35,093	0	778,527
Male	Percentage of sample	0.3	0.0	1.9	16.5	0.2	32.0	0.8	0.3	1.1	0.0	53.2
	Number in catch	4,809	683	31,610	277,866	3,015	539,158	13,431	5,468	19,139	378	895,556
Total	Percentage of sample	0.3	0.0	4.1	27.9	0.2	62.1	1.5	0.6	3.2	0.0	100.0
	Number in catch	5,064	683	69,784	468,827	3,460	1,045,441	25,085	9,606	54,232	378	1,682,559
	Standard error	1,191	683	5,176	12,261	1,117	13,361	3,169	1,908	4,337	378	

Appendix B.18 Estimated age and sex composition of chinook salmon harvested in the Copper River District commercial common property drift gillnet fishery, 1999.

		Brood Year and Age Class							
		1995	1994		1993		1992		
		1.2	1.3	2.2	1.4	2.3	1.5	2.4	Total
Strata Combined:	05/14 - 10/08								
Sampling dates:	05/14 - 10/08								
Sample size:	1,694								
Female	Percentage of sample	2.7	28.8	0.3	15.7	0.7	0.2	0.1	48.5
	Number in catch	1,661	17,980	166	9,759	464	100	86	30,216
Male	Percentage of sample	7.0	23.1	0.1	20.3	0.5	0.4	0.1	51.5
	Number in catch	4,343	14,390	81	12,645	283	266	86	32,094
Total	Percentage of sample	9.6	51.9	0.4	35.9	1.2	0.6	0.3	100.0
	Number in catch	6,004	32,370	247	22,405	774	366	172	62,337
	Standard error	480	796	99	757	181	114	86	

Appendix B.19 Estimated age and sex composition of coho salmon harvested in the Copper River District commercial common property drift gillnet fishery, 1999.

		Brood Year and Age Class			Total
		1996	1995	1994	
		1.1	2.1	3.1	
Strata Combined:	06/04 - 10/08				
Sampling dates:	08/18 - 09/17				
Sample size:	1,260				
Female	Percentage of sample	24.6	9.8	0.3	34.7
	Number in catch	37,663	14,979	466	53,108
Male	Percentage of sample	47.1	18.2	0.0	65.3
	Number in catch	72,028	27,874	51	99,953
Total	Percentage of sample	71.7	28.0	0.3	100.0
	Number in catch	109,691	42,853	517	153,061
	Standard error	2,206	2,200	259	

Appendix B.20. Commercial salmon catch by species in the Bering River District, 1973 - 1999.

Year	Catch by Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1973	285	15,426	65,348	2	5	81,066
1974	32	4,208	28,615	7	2	32,864
1975	162	21,637	24,162	0	0	45,961
1976	228	30,908	42,423	43	1	73,603
1977	127	14,445	47,218	192	221	62,203
1978	331	33,554	91,097	266	2,391	127,639
1979	385	139,015	114,046	6,895	23,094	283,435
1980 ^a	0	0	108,872	0	0	108,872
1981	200	55,585	82,626	9,882	8,307	156,600
1982	254	129,667	144,752	47	333	275,053
1983	610	179,273	117,669	851	4,615	303,018
1984	330	91,784	214,632	309	20,408	327,463
1985	215	26,561	419,276	214	9,642	455,908
1986	128	19,038	115,809	15	243	135,233
1987	34	16,926	15,864	54	7	32,885
1988	19	7,152	86,539	23	181	93,914
1989	30	9,225	26,952	7	2	36,216
1990	14	8,332	42,952	2	1	51,301
1991	28	19,181	110,951	4	195	130,359
1992	21	19,721	125,616	4	1	145,363
1993	130	33,951	115,833	82	22	150,018
1994	121	27,926	259,003	34	63	287,147
1995	44	21,585	282,045	26	229	303,929
1996	111	37,712	93,763	0	30	131,616
1997	23	9,651	97	2	0	9,773
1998	70	8,439	12,284	5	2	20,800
1999	42	13,697	9,852	204	96	23,891
Ten Year Average (1989-98)	59	19,572	106,950	17	55	126,652

^a In 1980 no fishing was allowed prior to August 11.

Appendix B.21. Commercial salmon harvest by period in the Bering River District drift gillnet fishery, 1999.

Period	Date ^{a,b}	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1	06/14	12	2	2	13	233	410	3,203	0	0	0	0	0	0
2	06/18	12	3	3	10	248	813	4,751	0	0	0	0	39	275
3	06/24	24	19	28	16	327	4,189	24,633	0	0	0	0	0	0
4	06/28	24	6	7	2	13	1,697	10,674	0	0	0	0	0	0
5	07/01	36	3	4	0	0	773	4,483	0	0	0	0	0	0
6	07/05	36	1	1	0	0	309	1,791	0	0	0	0	0	0
7	07/08	36	0	0	0	0	0	0	0	0	0	0	0	0
8	07/12	36	1	2	0	0	826	4,856	0	0	0	0	0	0
9	07/15	36	0	0	0	0	0	0	0	0	0	0	0	0
10	07/19	48	10	15	1	12	3,557	21,470	67	622	4	12	4	45
11	07/22	48	5	6	0	0	1,088	5,989	7	48	145	437	37	337
12	07/26	48	2	2	0	0	16	98	6	42	20	60	16	140
13	07/29	48	0	0	0	0	0	0	0	0	0	0	0	0
14	08/02	36	0	0	0	0	0	0	0	0	0	0	0	0
15	08/05	36	0	0	0	0	0	0	0	0	0	0	0	0
16	08/09	24	1	1	0	0	5	34	66	530	0	0	0	0
17	08/16	24	7	10	0	0	3	18	776	4,960	35	101	0	0
18	08/23	24	11	20	0	0	5	27	2,358	19,293	0	0	0	0
19	08/30	24	36	59	0	0	6	35	6,572	53,322	0	0	0	0
Total		612	107	160	42	833	13,697	82,062	9,852	78,817	204	610	96	797
Average Weight (lbs)						19.83		5.99		8.00		2.99		8.30

^a For starting times of specific openings refer to Appendix B.26.

^b Starting date of period.

Appendix B.22. Aerial escapement indices by date and location for sockeye salmon returning to the Bering River Delta, 1999.

Bering River Delta ^a							
System and Drainage	Survey System	June 18	June 26	July 2	July 9	July 16	July 28
Bering River	Bering River	3,200	7,000	890	350	800	7,400
	Bering Lake	50	9,600	14,700	19,400	12,300	17,230
	Dick Creek	0	500	4,200	1,900	21,900	14,400
	Shepherd Creek - Lagoon	NC	NC	280	0	0	1,000
	Shepherd Creek	NS	NS	NS	NS	0	200
	Carbon Creek	NS	NS	NS	NS	NS	15
	Clear Creek	NS	NS	NS	NS	NS	250
	Kushtaka Lake	NS	NS	NS	NS	NS	0
	Shockum Creek	NS	NS	NS	NS	NS	0
Kattalla River ^b	Katalla River	0	2,300	2,350	800	2,800	3,900
Bering River Aerial Survey Daily Index		3,250	19,400	22,420	22,450	37,800	44,395
Anticipated Escapement Index ^c		8,033	12,810	23,333	23,990	25,483	24,242

Bering River Delta ^a							
System and Drainage	Survey System	August 3	August 10	August 17	August 25	Sept. 08	Sept. 28
Bering River	Bering River	300	500	2,500	400	300	0
	Bering Lake	6,500	2,300	3,200	1,500	5,400	2,000
	Dick Creek	20,800	15,800	6,300	4,000	3,300	300
	Shepherd Creek - Lagoon	0	1,000	100	NC	0	NS
	Shepherd Creek	0	80	120	0	50	NS
	Carbon Creek	110	110	150 +	30	50	NS
	Clear Creek	950 +	800	300	0	0	NS
	Kushtaka Lake	430	700 +	270	205	0	NS
	Shockum Creek	0	0	400 +	50	25	NS
Kattalla River ^b	Katalla River	750	380	300	200	10	0
Bering River Aerial Survey Daily Index		29,840	21,670	13,640	6,385	9,135	2,300
Anticipated Escapement Index ^c		21,151	21,881	8,947	2,099	872	

-continued-

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Bering River Delta ^a				
System and Drainage	Survey System	Site ^d	System ^e	Anticipated
	Bering River	7,400	39,030	21,600
	Bering Lake	17,230		
	Dick Creek	14,400		
	Shepherd Creek - Lagoon	1,000		
	Shepherd Creek	200		
	Carbon Creek	15		
	Clear Creek	950	950	1,500
	Kushtaka Lake	700	1,100	1,600
	Shockum Creek	400		
Kattalla River ^b	Katalla River	3,900		
Bering River Aerial Survey Daily Index			41,080	
Anticipated Escapement Index ^c				26,600

^a The survey sites represent most of the known sockeye salmon spawning locations in the Bering River drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but have been used for that purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate seen in less than ideal conditions. The symbol * indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote d).

^b This stream is not included in the estimated escapement delta wide, it is a non-index stream.

^c For systems not flown on any given survey the expected for that system was subtracted from the total anticipated for that survey.

^d The escapement estimates for each site is in the astricted survey estimate. Where the survey site is a terminal spawning area the peak count is used. However, if the site is a schooling area for migratory fish bound for sites further upstream, the count which minimizes possible duplication of counts across dates is selected.

^e The sum of the estimates by site within a system.

Appendix B.24. Aerial escapement indices by date and location for coho salmon returning to the Bering River Delta, 1999.

Bering River Delta ^a		Aerial Escapement Indices by Survey Date				
System and Drainage	Survey System	August 11	August 17	August 25	Sept. 08	Sept. 28
Bering River	Bering River ^b	1,500	1,400	940	2,300	2,800 *
	Bering Lake	300	200	400	3,500	11,000 *
	Dick Creek	0	0	200	2,800	1,270 *
Shepherd Drainage ^c	Shepherd Creek - Lagoon	0	20	NC	100 *	NS
	Shepherd Creek	0	0	0	100 *	NS
	Carbon Creek	0	0	0	0 *	NS
Katalla River	Katalla River	200	0	300	2,400	3,000 *
Lower Bering River	Gandil River	0	0	0	450	3,000 *
	Nichawak River	0	0	230	400	4,800 *
Controller Bay	Campbell River	0	0	0	1,500 *	290
	Edwards River	0	0	180	1,500 *	600
	Okalee River	0	0	500	2,200 *	10
	Other Clear Streams	0	0	0	0	20 *
Bering River Aerial Survey Daily Index		2,000	1,620	2,750	17,250	26,790
Anticipated Aerial Index^d		1,466	7,488	11,166	20,162	17,395

Bering River Delta ^a		Estimated Escapement		
System and Drainage	Survey System	Site ^e	System	System
Bering River	Bering River ^b	2,800	15,070	5,700
	Bering Lake	11,000		
	Dick Creek	1,270		
Shepherd Drainage ^c	Shepherd Creek - Lagoon	100	200	
	Shepherd Creek	100		
	Carbon Creek	0		
Katalla River	Katalla River	3,000	3,000	4,000
Lower Bering River	Gandil River	3,000	7,800	2,600
	Nichawak River	4,800		
Controller Bay	Campbell River	1,500	5,220	9,900
	Edwards River	1,500		
	Okalee River	2,200		
	Other Clear Streams	20		
Bering River/Controller Bay Aerial Survey Total			31,290	
Anticipated Aerial Index			22,200	

^a The survey sites represent most of the known coho salmon spawning locations in the Bering River drainage. Weather permitting, the sites are surveyed weekly. The surveys provide information about the relative strength of escapement among years and within a year, time for spawning sites and relative escapement strength among sites. The indices are not intended to provide an actual estimate of escapement for coastal stocks but have been used for that purpose in the absence of any other escapement estimating method. The abbreviations used in the following table have the following meaning: NS = no survey, NC = surveyed but no count due to poor conditions. The + sign after some counts indicates that the count is the minimum estimate seen in less than ideal conditions. The symbol * indicates that this survey count was used as the peak survey for the site without duplication of counts for survey sites along migratory corridors (see footnote e).

^b Bering River counts include coho observed in the Don Miller Hill tributaries.

^c This stream is not included in the estimated escapement delta wide, it is a non-index stream.

^d Systems not flown on a survey, the expected for that system was subtracted from the total anticipated.

^e The escapement estimates for each site is in the astricted survey estimate. Where the survey site is a terminal spawning area the peak count is used. However, if the site is a schooling area for migratory fish bound for sites further upstream, the count which minimizes possible duplication of counts across dates is selected.

^f The sum of the estimates by site within a system

Appendix B.25 Estimated age and sex composition of coho salmon harvested in the Bering River District commercial common property drift gillnet fishery, 1999.

		Brood Year and Age Class			Total
		1996	1995	1994	
		1.1	2.1	3.1	
Strata Combined:	07/19 - 09/01				
Sampling dates:	09/01 - 09/01				
Sample size:	415				
Female	Percentage of sample	15.9	16.9	0.2	33.0
	Number in catch	1,567	1,662	24	3,252
Male	Percentage of sample	43.9	22.9	0.2	67.0
	Number in catch	4,321	2,255	24	6,600
Total	Percentage of sample	59.8	39.8	0.5	100.0
	Number in catch	5,887	3,917	47	9,852
	Standard error	237	237	34	

Appendix B.26. Summary of periods and emergency orders issued for the commercial salmon gillnet fisheries in the Bering and Copper River Districts, 1999.

Bering River District (200)			Copper River District (212)			Emergency Orders Issued
Periods	Dates	Hours Fished	Periods	Dates	Hours Fished	
			01 ^a	05/14	12	2-F-E-05-99
			02	05/17	12	2-F-E-07-99
			03	05/21	12	2-F-E-08-99
			04	05/24	12	2-F-E-09-99
			05	05/27-05/28	24	2-F-E-10-99
			06	05/31-06/01	24	2-F-E-12-99
			07	06/04	12	2-F-E-13-99
01	06/14	12	08	06/14	12	2-F-E-14-99
						2-F-E-16-99
02	06/18	12	09	06/18	12	2-F-E-17-99
03	06/24-06/25	24	10	06/24-06/25	24	2-F-E-19-99
04	06/28-06/29	24	11	06/28-06/29	24	2-F-E-21-99
05	07/01-07/02	36	12	07/01-07/02	36	2-F-E-23-99
06	07/05-07/06	36	13	07/05-07/06	36	2-F-E-25-99
			14	07/08-07/09	36	2-F-E-32-99
08	07/12-07/13	36	15	07/12-07/13	36	2-F-E-34-99
			16	07/15-07/16	36	2-F-E-44-99
10	07/19-07/21	48	17	07/19-07/21	48	2-F-E-46-99
11	07/22-07/24	48	18	07/22-07/24	48	2-F-E-55-99
12	07/26-07/28	48	19	07/26-07/28	48	2-F-E-55-99
			20	07/29-07/31	48	2-F-E-56-99
			21	08/02-08/03	36	2-F-E-61-99
			22	08/05-08/06	36	2-F-E-65-99
16	08/09-08/10	24	23	08/09-08/10	24	2-F-E-66-99
17	08/16-08/17	24	24	08/16-08/17	24	2-F-E-72-99
18	08/23-08/24	24	25	08/23-08/24	24	2-F-E-80-99
19	08/30-08/31	24	26	08/30-08/31	24	2-F-E-83-99
			27	09/16-09/17	24	2-F-E-94-99
			28	09/23-09/24	24	2-F-E-96-99
			29	09/30-10/01	24	2-F-E-97-99
			30	10/07-10/08	24	2-F-E-99-99

^a The Copper River schedule is typically two 24-hour periods per week; from 7:00 a.m. Monday to 7:00 a.m. Tuesday and from 7:00 p.m. Thursday to 7:00 p.m. Friday. All 12-hours periods began at 7:00 a.m.

^b The following waters were closed to commercial fishing during the 12-hour period on May 14:
The waters inside of a line from the Steamboat marker to the U.S.C.G. light on the west side of Pete Dahl entrance to the ADF&G marker located on the east side of Pete Dahl entrance and from the U.S.C.G. light on the west side of Grass Island entrance to the ADF&G marker located on the east side of Grass Island entrance and from the U.S.C.G light on the west side of Kokenhinik Island entrance to the ADF&G marker located on the east side of Kokenhinik Island entrance and all waters west of the ADF&G marker at Coffee Creek.

^c All fishing periods after August 8 in the Copper and Bering River Districts began at 12:00 noon.

^d The Copper and Bering River Districts closed for the 1999 season at 12:01 p.m. Friday, October 8, 1998.

Appendix C.1. Commercial salmon harvest by period in the Coghill District drift gillnet and purse seine fisheries, Prince William Sound, 1999.

Period	Date ^a	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
DRIFT GILLNET														
01	06/14	24	127	219	81	1,186	431	2,716	0	0	0	0	65,449	550,951
02	06/18	12	64	107	26	389	310	1,938	0	0	0	0	55,693	467,849
03	06/24	24	132	359	41	512	2,322	14,927	0	0	7	25	131,957	1,117,096
04	06/28	12	111	188	22	272	2,370	15,211	0	0	0	0	73,520	617,214
05	06/30	14	84	124	11	191	2,523	16,023	0	0	0	0	41,269	340,417
06	07/02	14	60	95	8	147	2,897	18,661	0	0	8	30	40,810	336,716
07	07/04	62	105	430	105	968	36,861	223,935	8	47	85	334	103,287	833,747
08	07/06	72	115	432	60	701	22,298	132,989	13	94	303	1,121	81,842	661,140
09	07/09	96	92	312	13	125	15,420	92,746	121	647	3,342	12,066	63,579	516,307
10	07/13	72	62	147	14	181	11,893	71,128	662	3,910	8,421	26,891	21,418	169,942
11	07/16	96	40	105	20	188	7,712	45,225	219	1,631	18,039	54,812	9,324	73,490
12	07/20	22	13	16	0	0	745	4,133	82	368	1,599	6,336	652	5,400
13	07/22	12	3	3	0	0	146	846	0	0	269	914	187	1,614
14	07/25	12	1	1	0	0	23	143	0	0	99	299	53	445
15	07/27	12	3	3	0	0	77	437	9	63	236	695	170	1,280
Total		556	239	2,541	401	4,860	106,028	641,058	1,114	6,760	32,408	103,523	689,210	5,693,608
Average Weight						12.12		6.05		6.07		3.19		8.26
PURSE SEINE														
01	07/10	6	10	24	1	30	0	0	0	0	2	6	151,398	1,184,518
02	07/12	6	8	18	0	0	0	0	0	0	4	13	129,708	993,412
03	07/14	6	7	14	1	18	2	8	0	0	12	33	107,658	863,912
04	07/16	6	5	11	27	324	0	0	0	0	12	32	91,125	726,693
05	07/18	6	5	6	0	0	0	0	0	0	0	0	49,278	374,360
06	07/20	6	5	9	0	0	199	1,196	0	0	2,000	6,210	47,880	383,851
07	07/22	12	6	7	0	0	620	4,266	15	102	10,541	33,991	12,774	98,814
08	07/25	12	5	5	1	13	96	432	11	54	3,133	8,583	23,491	176,052
09	07/27	12	2	2	0	0	0	0	0	0	8,156	24,466	5,680	45,434
10	07/29	36	3	3	0	0	159	959	14	124	18,801	56,409	773	6,584
11	07/31	12	5	5	3	77	26	131	0	0	15,147	45,445	205	1,436
12	08/02	12	3	3	0	0	101	609	0	0	29,576	73,224	137	1,138
13	08/04	36	6	10	0	0	267	1,338	21	148	139,371	380,440	305	2,139
14	08/06	36	21	32	0	0	645	3,684	111	707	311,851	934,622	527	4,286
15	08/08	36	12	17	1	21	415	2,265	42	276	167,139	449,754	181	1,428
16	08/10	12	2	2	0	0	10	61	0	0	10,148	27,031	9	72
17	08/12	12	0	0	0	0	0	0	0	0	0	0	0	0
18	08/14	12	16	23	0	0	253	1,483	10	74	381,145	1,094,313	47	362
19	08/16	12	26	32	0	0	177	1,070	19	140	525,102	1,481,798	65	482
20	08/18	12	22	30	0	0	72	445	3	26	313,532	934,765	60	483
21	08/20	12	16	16	0	0	46	276	2	12	199,000	572,057	10	80
22	08/22	12	9	11	0	0	93	561	17	123	166,561	461,982	20	159
23	08/24	12	10	10	0	0	30	183	3	23	203,093	547,716	7	57
24	08/25	60	3	9	0	0	16	100	4	20	242,255	702,737	6	45
25	08/28	84	5	11	0	0	0	0	5	36	289,688	888,112	2	20
26	09/01	60	3	7	0	0	0	0	15	96	157,728	433,751	0	0
27	09/04	84	3	11	0	0	2	11	46	301	294,674	902,876	3	10
28	09/08	60	0	0	0	0	0	0	0	0	0	0	0	0
29	09/11	84	2	2	0	0	0	0	0	0	21,051	60,976	0	0
Total		768	62	330	34	483	3,229	19,078	338	2,262	#####	#####	621,349	4,865,827
Average Weight						14.21		5.91		6.69		2.88		7.83
Combined Total				2,871	435	5,343	109,257	660,136	1,452	9,022	#####	#####	#####	#####
Average Weight						12.28		6.04		6.21		2.89		8.06

^a Starting date of period.

Appendix C.2. Commercial salmon catch by species in the Coghill District, Prince William Sound, 1981 - 1999.

CATCH BY SPECIES						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
DRIFT GILLNET						
1981	152	101,058	1,008	526,739	131,399	760,356
1982	127	929,965	213	181,925	252,077	1,364,307
1983	340	38,273	1,013	233,263	234,022	506,911
1984	396	94,956	563	897,496	264,878	1,258,289
1985	380	339,296	1,131	454,531	246,824	1,042,162
1986	617	381,565	789	68,887	218,971	670,829
1987	352	377,454	13,396	712,897	318,842	1,422,941
1988	501	82,294	41,307	1,314,061	346,388	1,784,551
1989	364	106,114	80,737	628,522	194,584	1,010,321
1990	126	11,988	128,605	1,907,510	301,209	2,349,438
1991	92	3,888	78,363	231,501	34,223	348,067
1992	242	57,919	86,782	167,384	182,433	494,760
1993	576	66,532	37,898	141,279	635,208	881,493
1994	390	12,928	50,879	58,334	554,181	676,712
1995	468	57,797	29,343	161,493	379,659	628,760
1996	575	177,530	20,926	59,447	612,969	871,447
1997	862	227,231	5,618	154,969	689,977	1,078,657
1998	605	59,463	2,925	383,604	347,317	793,914
1999	401	106,028	1,114	32,408	689,210	829,161
Ten Year Average (1989-98)	430	78,139	52,208	389,404	393,176	913,357
PURSE SEINE						
1981	1	1,997	0	34,083	23,378	59,459
1982	23	17,466	29	1,006,579	135,553	1,159,650
1983	0	175	16	41,048	8,958	50,197
1984	0	21	0	10,911	1,126	12,058
1985	85	10,757	112	69,242	19,330	99,526
1986	186	18,514	98	145,706	27,078	191,582
1987	58	38,899	1,956	865,671	59,252	965,836
1988	63	1,623	15,787	1,600,481	11,755	1,629,709
1989	61	2,030	39,484	3,296,965	124,639	3,463,179
1990	2	286	11,819	785,278	10,951	808,336
1991	11	1,562	621	1,980,074	11,519	1,993,787
1992	6	765	27,382	196,503	1,603	226,259
1993	46	6,250	1,760	352,468	3,645	364,169
1994	50	21,060	30,517	3,538,760	3,575	3,593,962
1995	33	20,670	5,337	917,200	2,597	945,837
1996	1	2,640	5,319	1,484,422	463	1,492,845
1997	7	5,694	1,269	1,875,617	33,139	1,915,726
1998	20	1,702	1,531	2,845,157	21,600	2,870,010
1999	34	3,229	338	3,509,722	621,349	4,134,672
Ten Year Average (1989-98)	24	6,266	12,504	1,727,244	21,373	1,767,411
COMBINED GEARS						
1981	153	103,055	1,008	560,822	154,777	819,815
1982	150	947,431	242	1,188,504	387,630	2,523,957
1983	340	38,448	1,029	274,311	242,980	557,108
1984	396	94,977	563	908,407	266,004	1,270,347
1985	465	350,053	1,243	523,773	266,154	1,141,688
1986	803	400,079	887	214,593	246,049	862,411
1987	410	416,353	15,352	1,578,568	378,094	2,388,777
1988	564	83,917	57,094	2,914,542	358,143	3,414,260
1989	425	108,144	120,221	3,925,487	319,223	4,473,500
1990	128	12,274	140,424	2,692,788	312,160	3,157,774
1991	103	5,450	78,984	2,211,575	45,742	2,341,854
1992	248	58,684	114,164	363,887	184,036	721,019
1993	622	72,782	39,658	493,747	638,853	1,245,662
1994	440	33,988	81,396	3,597,094	557,756	4,270,674
1995	501	78,467	34,680	1,078,693	382,256	1,574,597
1996	576	180,170	26,245	1,543,869	613,432	2,364,292
1997	869	232,925	6,887	2,030,586	723,116	2,994,383
1998	625	61,165	4,456	3,228,761	368,917	3,663,924
1999	435	109,257	1,452	3,542,130	1,310,559	4,963,833
Ten Year Average (1989-98)	454	84,405	64,712	2,116,649	414,549	2,680,768

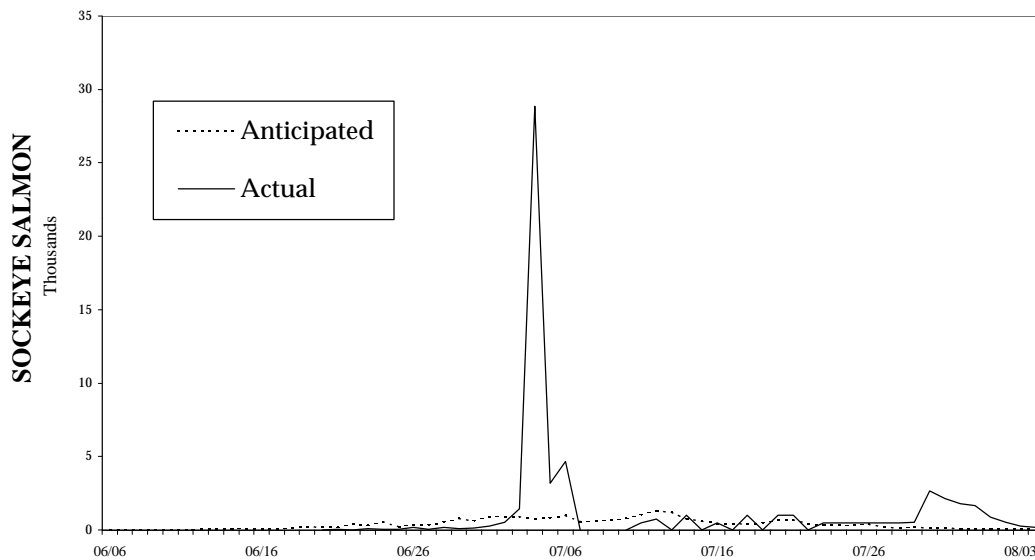
Appendix C.3. Daily salmon escapement through the Coghill River weir,
Prince William Sound, 1999.

Date	Sockeye		Pink ^a		Chum		Coho		Chinook	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
06/05	0	0	0	0	0	0	0	0	0	0
06/06	0	0	0	0	0	0	0	0	0	0
06/07	0	0	0	0	0	0	0	0	0	0
06/08	0	0	0	0	0	0	0	0	0	0
06/09	0	0	0	0	0	0	0	0	0	0
06/10	0	0	0	0	0	0	0	0	0	0
06/11	0	0	0	0	0	0	0	0	0	0
06/12	0	0	0	0	0	0	0	0	0	0
06/13	0	0	0	0	0	0	0	0	0	0
06/14	7	7	0	0	0	0	0	0	0	0
06/15	3	10	0	0	0	0	0	0	0	0
06/16	1	11	0	0	0	0	0	0	0	0
06/17	0	11	0	0	0	0	0	0	0	0
06/18	7	18	0	0	0	0	0	0	0	0
06/19	0	18	0	0	0	0	0	0	0	0
06/20	3	21	0	0	0	0	0	0	0	0
06/21	30	51	0	0	0	0	0	0	0	0
06/22	6	57	0	0	0	0	0	0	0	0
06/23	70	127	0	0	0	0	0	0	0	0
06/24	56	183	0	0	0	0	0	0	0	0
06/25	56	239	0	0	0	0	0	0	0	0
06/26	162	401	0	0	0	0	0	0	0	0
06/27	55	456	0	0	0	0	0	0	0	0
06/28	170	626	0	0	1	1	0	0	0	0
06/29	103	729	0	0	1	2	0	0	1	1
06/30	137	866	0	0	0	2	0	0	0	1
07/01	249	1,115	0	0	0	2	0	0	0	1
07/02	528	1,643	0	0	0	2	0	0	0	1
07/03	1,434	3,077	2	2	1	3	0	0	1	2
07/04	28,838	31,915	9	11	10	13	0	0	2	4
07/05	3,163	35,078	2	13	3	16	0	0	0	4
07/06	4,684	39,762	5	18	5	21	0	0	0	4
07/07	0	39,762	0	18	0	21	0	0	1	5
07/08	0	39,762	0	18	0	21	0	0	0	5
07/09	0	39,762	0	18	0	21	0	0	0	5
07/10	0	39,762	15	33	1	22	0	0	0	5
07/11	462	40,224	62	95	0	22	0	0	0	5
07/12	760	40,984	106	201	0	22	0	0	1	6
07/13	0	40,984	0	201	0	22	0	0	0	6
07/14	1,020	42,004	811	1,012	3	25	0	0	1	7
07/15	0	42,004	60	1,072	5	30	0	0	1	8
07/16	500	42,504	888	1,960	6	36	0	0	0	8
07/17	0	42,504	0	1,960	0	36	0	0	0	8
07/18	1,001	43,505	1,520	3,480	14	50	0	0	0	8
07/19	0	43,505	574	4,054	2	52	0	0	0	8
07/20	1,000	44,505	5,106	9,160	17	69	0	0	3	11
07/21	1,000	45,505	4,849	14,009	9	78	0	0	0	11
07/22	0	45,505	0	14,009	0	78	0	0	0	11
07/23	500	46,005	5,050	19,059	14	92	0	0	0	11
07/24	500	46,505	7,517	26,576	22	114	0	0	1	12
07/25	500	47,005	4,132	30,708	5	119	0	0	0	12
07/26	500	47,505	3,508	34,216	6	125	0	0	0	12
07/27	500	48,005	5,745	39,961	17	142	0	0	3	15
07/28	500	48,505	2,893	42,854	11	153	0	0	1	16
07/29	520	49,025	1,060	43,914	4	157	0	0	0	16
07/30	2,656	51,681	19,486	63,400	22	179	0	0	2	18
07/31	2,148	53,829	12,440	75,840	15	194	0	0	1	19
08/01	1,792	55,621	10,076	85,916	6	200	0	0	0	19
08/02	1,669	57,290	19,543	105,459	23	223	0	0	2	21
08/03	882	58,172	18,640	124,099	24	247	0	0	0	21
08/04	537	58,709	11,387	135,486	9	256	0	0	2	23
08/05	270	58,979	6,745	142,231	15	271	0	0	0	23
08/06	158	59,137	5,275	147,506	8	279	0	0	1	24
08/07	174	59,311	8,417	155,923	17	296	0	0	0	24
Totals	59,311		155,923		296		0		24	

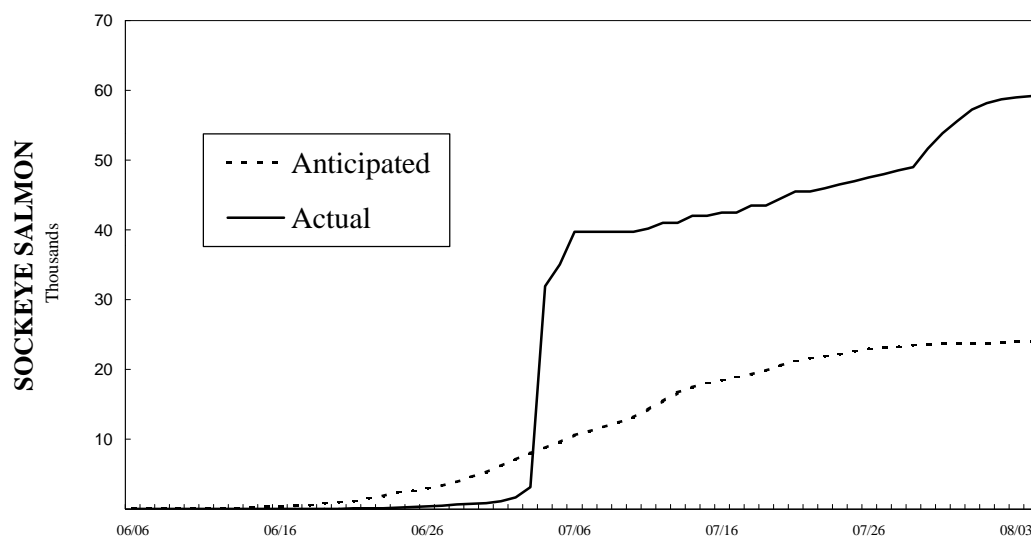
^a Count may be incomplete. The Coghill weir is designed to prohibit the passage of sockeye salmon, but smaller pink salmon may pass through the weir uncounted.

COGHILL LAKE SOCKEYE SALMON ESCAPEMENT

DAILY



CUMULATIVE



Appendix C.4. Anticipated daily and cumulative sockeye salmon escapement versus actual escapement past the Coghill River weir, Prince William Sound, 1999.

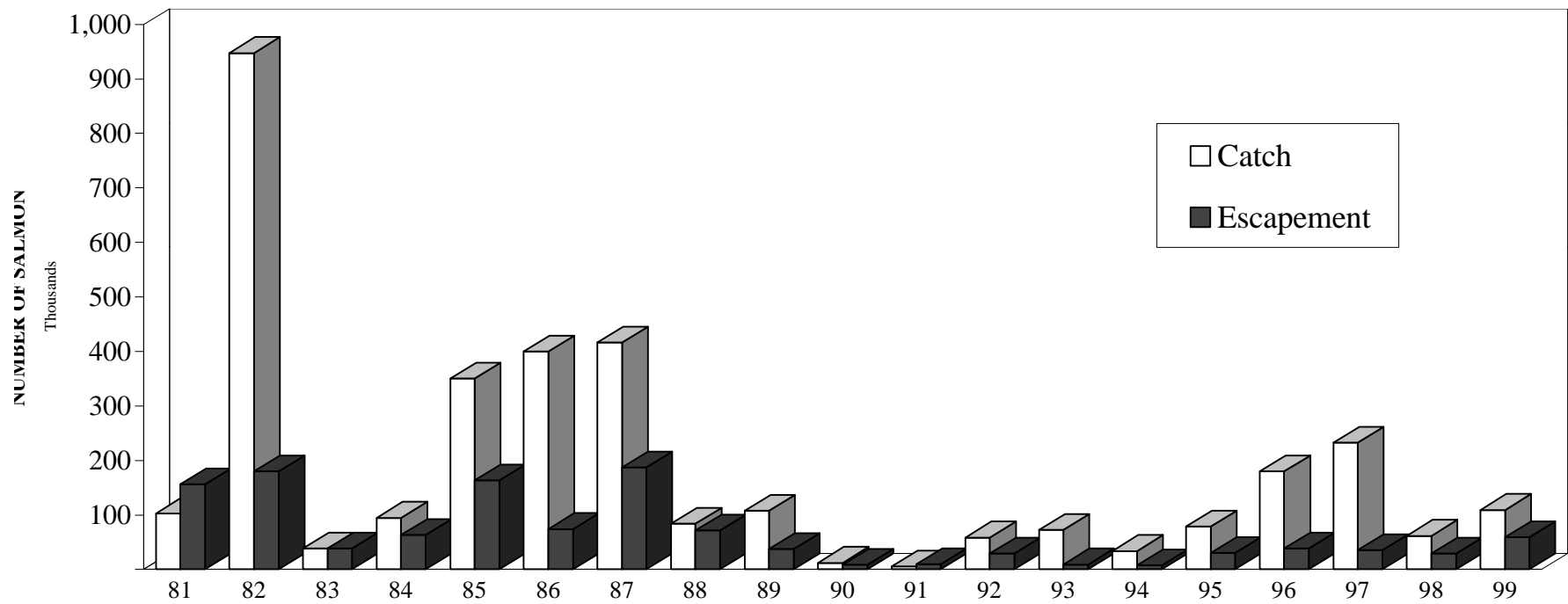
Appendix C.5. Salmon escapement by species in the Coghill District, Prince William Sound,
1970 - 1999.

Year	Sockeye ^a	Pink ^b	Chum ^b
1970	35,200	95,170	11,880
1971	15,000	62,160	6,600
1972	51,000	30,960	28,160
1973	55,000	493,780	72,610
1974	22,333	56,940	29,280
1975	34,855	452,430	3,640
1976	9,056	57,090	25,670
1977	31,562	130,510	43,940
1978	42,284	85,450	18,160
1979	48,281	70,980	6,330
1980	142,253	214,930	23,340
1981	156,112	106,450	2,050
1982	180,314	368,380	22,130
1983	38,783	310,330	61,410
1984	63,622	429,450	19,690
1985	163,311	296,970	22,140
1986	71,095	101,600	13,140
1987	187,263	147,060	24,510
1988	72,052	37,070	39,240
1989	37,751	45,510	22,680
1990	8,949	49,110	26,020
1991	9,752	98,580	6,070
1992	29,642	23,611	10,003
1993	9,232	41,837	8,430
1994	7,264	65,648	14,176
1995	30,382	46,029	11,596
1996	38,693	104,781	19,669
1997	35,517	52,961	3,101
1998	28,923	85,968	22,764
1999	59,311	168,816	5,057
10 Year Average (1989-1998)	23,611	61,404	14,451

^a Escapement count of sockeye salmon past the Coghill River weir.

^b Pink and chum escapements estimated for streams in district by aerial surveys. Historical data revised in 1990.

SOCKEYE SALMON CATCH AND ESCAPEMENT IN THE COGHILL DISTRICT



Appendix C.6. Sockeye salmon catch and escapement in the Coghill District, Prince William Sound, 1981 - 99.

Appendix C.7.

Estimated age and sex composition of sockeye salmon harvested in the Coghill District commercial common property drift gillnet fishery, 1999.

		Brood Year and Age Class				Total
		1995	1994		1993	
		1.2	1.3	2.2	1.4	
Stratum dates:	06/14 - 07/27					
Sampling dates:	07/06 - 07/06					
Sample size:	578					
Female	Percentage of sample	36.7	1.7	1.4	0.0	39.8
	Number in catch	38,889	1,834	1,468	0	42,191
Male	Percentage of sample	58.7	0.2	1.2	0.2	60.2
	Number in catch	62,186	183	1,284	183	63,837
Total	Percentage of sample	95.3	1.9	2.6	0.2	100.0
	Number in catch	101,075	2,018	2,752	183	106,028
	Standard error	931	603	702	183	

Appendix C.8. Temporally stratified age and sex composition of the sockeye salmon escapement through the Coghill River weir, 1999.

		Brood Year and Age Class						
		1996	1995	1994		1993		
		1.1	1.2	1.3	2.2	1.4	2.3	Total
Stratum dates:	06/14 - 07/02							
Sampling dates:	07/01 - 07/02							
Sample size:	497							
Female	Percentage of sample	0.0	37.0	0.6	1.0	0.0	0.2	38.8
	Number in escapement	0	608	10	17	0	3	638
Male	Percentage of sample	0.2	48.5	9.5	2.8	0.2	0.0	61.2
	Number in escapement	3	797	155	46	3	0	1,005
Total	Percentage of sample	0.2	85.5	10.1	3.8	0.2	0.2	100.0
	Number in escapement	3	1,405	165	63	3	3	1,643
	Standard error	3	26	22	14	3	3	
Stratum dates:	07/03 - 07/05							
Sampling dates:	07/05 - 07/05							
Sample size:	493							
Female	Percentage of sample	0.0	37.5	2.6	1.6	0.0	0.4	42.2
	Number in escapement	0	12,547	882	543	0	136	14,106
Male	Percentage of sample	0.6	43.2	12.2	1.4	0.0	0.4	57.8
	Number in escapement	203	14,446	4,069	475	0	136	19,329
Total	Percentage of sample	0.6	80.7	14.8	3.0	0.0	0.8	100.0
	Number in escapement	203	26,992	4,951	1,017	0	271	33,435
	Standard error	117	595	535	259	0	135	
Stratum dates:	07/06 - 07/12							
Sampling dates:	07/11 - 07/12							
Sample size:	471							
Female	Percentage of sample	0.0	57.1	2.3	1.9	0.0	0.0	61.4
	Number in escapement	0	3,373	138	113	0	0	3,624
Male	Percentage of sample	0.6	30.4	7.0	0.6	0.0	0.0	38.6
	Number in escapement	38	1,793	414	38	0	0	2,282
Total	Percentage of sample	0.6	87.5	9.3	2.5	0.0	0.0	100.0
	Number in escapement	38	5,166	552	150	0	0	5,906
	Standard error	22	90	79	43	0	0	

-continued-

Appendix C.9. Commercial salmon harvest by period in the Unakwik District drift gillnet and purse seine fisheries, Prince William Sound, 1999.

DRIFT GILLNET

Period	Date ^{a,b}	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
01	06/24-06/25	24	4	4	0	0	2,096	13,085	0	0	0	0	6	54
02	06/28	12	8	13	1	7	2,487	14,968	0	0	0	0	21	176
03	06/30-07/01	14	8	8	0	0	1,025	6,162	0	0	0	0	38	298
04	07/02	14	7	8	1	40	1,934	12,740	0	0	0	0	95	833
05	07/04-07/06	62	7	7	2	39	939	5,826	5	40	0	0	136	1,176
06	07/08-07/09	24	1	1	0	0	63	379	0	0	0	0	0	0
Total			15	41	4	86	8,544	53,160	5	40			296	2,537
Average Weight						21.50		6.22		8.00				8.57

PURSE SEINE

Period	Date ^{a,b}	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
04	07/02	14	1	1	1	8	386	2,506	0	0	0	0	2	20
Total			1	1	1	8	386	2,506					2	20
Average Weight						8.00		6.49						10.00

^a For area and opening times refer to Appendix C.11.

^b Starting date of period.

Appendix C.10. Commercial salmon catch by species in the Unakwik District,
Prince William Sound, 1980 - 1999.

CATCH BY SPECIES						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
DRIFT GILLNET						
1980	0	1,547	6	4,815	727	7,095
1981	0	2,445	0	4,152	1,530	7,927
1982	1	48,947	0	555	598	49,881
1983	3	13,215	0	1,515	1,426	16,159
1984	2	18,522	0	27,742	7,125	53,391
1985	26	27,552	22	9,191	5,942	40,713
1986	5	25,759	1	1,973	2,463	30,201
1987	2	5,894	1	4,871	1,556	12,124
1988	15	8,589	0	281	1,504	10,389
1989	31	21,412	27	41,820	404	63,694
1990	3	247	127	9,986	23	10,386
1991	13	4,482	11	12,299	118	16,923
1992	3	2,224	13	3,972	94	6,306
1993	5	14,691	4	5,338	978	19,016
1994	0	548	0	300	0	848
1995	8	2,116	0	1	36	2,161
1996	3	6,063	0	17	694	6,777
1997	3	3,411	0	0	177	3,591
1998	10	13,651	55	1,932	586	16,234
1999	4	8,544	5	0	296	8,849
Ten Year Average (1989-98)	8	6,885	24	7,567	511	14,594
PURSE SEINE						
1980	0	6	0	9,113	555	9,474
1981	0	108	0	71,624	17,650	89,382
1982	0	2	4	89,137	517	89,660
1983	0	6	0	5,544	716	4,066
1986	0	138	0	28,210	4,123	32,471
1985	0	76	0	4,718	4,675	9,469
1987	0	146	0	187,752	6,549	194,447
1988	0	667	7	57,844	23,860	82,378
1989	0	819	3	121,068	79	121,969
1992	0	42	2	13,264	119	13,427
1993	0	79	0	3,233	67	3,379
1994	0	226	102	588,901	75	589,302
1995	0	2,116	0	1	36	2,161
1996	0	6,063	0	17	694	6,777
1997	0	3,411	0	0	177	3,591
1998	0	13,651	55	1,932	586	16,234
1999	1	586	0	0	2	589
Ten Year Average (1989-98)	0	292	27	131,617	85	132,019
COMBINED GEARS						
1980	0	1,553	6	13,928	1,082	16,569
1981	0	2,553	0	75,776	18,980	97,309
1982	1	48,949	4	89,472	1,115	139,541
1983	3	13,221	0	4,859	2,142	20,225
1984	2	18,522	0	27,742	7,125	53,391
1985	26	27,670	22	57,401	8,065	73,184
1986	5	25,835	1	6,691	7,138	39,670
1987	2	6,040	1	192,623	7,905	206,571
1988	15	9,256	7	58,125	25,364	92,767
1989	31	21,412	27	41,820	404	63,694
1990	3	247	127	9,986	23	10,386
1991	13	5,301	14	133,367	197	138,892
1992	3	2,266	15	77,236	215	79,733
1993	5	14,770	4	6,571	1,045	22,395
1994	0	774	102	589,201	75	590,150
1995	8	2,116	0	1	36	2,161
1996	3	6,063	0	17	694	6,777
1997	4	3,797	0	0	179	3,980
1998	10	13,651	55	1,932	586	16,234
1999	5	8,930	5	0	298	9,238
Ten Year Average (1989-98)	8	7,040	34	60,013	345	67,440

NO catch recorded.

Appendix C.11. Summary of periods, dates, hours open, and emergency orders issued for the commercial salmon fisheries in the Coghill and Unakwik Districts, Prince William Sound, 1999.

Unakwik (229)					Coghill (223)				
Periods		Dates	Hours Open	Emergency Orders Issued	Periods		Dates	Hours Open	Emergency Orders Issued
P/S	GN				P/S	GN			
					01		06/14-06/15	24	2-F-E-15-99 ^a
					02		06/18-06/18	12	2-F-E-17-99 ^a
01	01	06/24-06/25	24	2-F-E-18-99 ^b	03		06/24-06/25	24	2-F-E-19-99 ^c
02	02	06/28-06/28	12	2-F-E-21-99 ^d	04		06/28-06/28	12	2-F-E-21-99 ^c
03	03	06/30-07/01	14	2-F-E-23-99 ^d	05		06/30-07/01	14	2-F-E-23-99 ^e
04	04	07/02-07/02	14	2-F-E-23-99 ^d	06		07/02-07/02	14	2-F-E-23-99 ^e
05	05	07/04-07/06	62	2-F-E-27-99 ^d	07		07/04-07/06	62	2-F-E-25-99 ⁱ , 2-F-E-27-99 ^g
					08		07/06-07/09	72	2-F-E-31-99 ^h
06	06	07/08-07/09	24	2-F-E-31-99 ⁱ					
					09		07/09-07/13	96	2-F-E-32-99 ^h
					01		07/10-07/10	6	2-F-E-33-99 ^j
07	07	07/12-07/13	24	2-F-E-31-99 ⁱ	02		07/12-07/12	6	2-F-E-35-99 ^j
					10		07/13-07/16	72	2-F-E-34-99 ^h
08	08	07/15-07/16	24	2-F-E-31-99 ⁱ	03		07/14-07/14	6	2-F-E-43-99 ^j
					04		07/16-07/16	6	2-F-E-41-99 ^j
					11		07/16-07/20	96	2-F-E-44-99 ^k
09	09	07/19-07/20	24	2-F-E-31-99 ⁱ	05		07/18-07/18	6	2-F-E-45-99 ^j
10	10	07/22-07/23	24	2-F-E-31-99 ⁱ	06	12	07/20-07/21	22	2-F-E-50-99 ^j
11	11	07/26-07/27	24	2-F-E-31-99 ⁱ	07	13	07/22-07/22	12	2-F-E-49-99 ^j
12	12	07/29-07/30	24	2-F-E-31-99 ⁱ					
					08	14	07/25-07/25	12	2-F-E-51-99 ^m
13	13	08/02-08/03	24	2-F-E-31-99 ⁱ	09	15	07/27-07/27	12	2-F-E-53-99 ^j
14	14	08/05-08/06	24	2-F-E-31-99 ⁱ	10	16	07/29-07/30	36	2-F-E-54-99 ⁿ
					11	17	07/31-07/31	12	2-F-E-59-99 ⁿ
15	15	08/09-08/10	24	2-F-E-31-99 ⁱ	12	18	08/02-08/02	12	2-F-E-60-99 ⁿ
					13	19	08/04-08/05	36	2-F-E-62-99 ⁿ
16	16	08/12-08/13	24	2-F-E-31-99 ^o , 2-F-E-98-99 ^p	14	20	08/06-08/07	36	2-F-E-67-99 ⁿ
					15	21	08/08-08/09	36	2-F-E-68-99 ⁿ
					16	22	08/10-08/10	12	2-F-E-69-99 ⁿ
					17	23	08/12-08/12	12	2-F-E-70-99 ⁿ
					18	24	08/14-08/14	12	2-F-E-74-99 ⁿ
					19	25	08/16-08/16	12	2-F-E-75-99 ^p
					20	26	08/18-08/18	12	2-F-E-76-99 ^p
					21	27	08/20-08/20	12	2-F-E-77-99 ^p
					22	28	08/22-08/22	12	2-F-E-78-99 ^p
					23	29	08/24-08/24	12	2-F-E-79-99 ^p
					24	30	08/25-08/27	60	2-F-E-79-99 ^p

-Continued-

Appendix C.11. (page 2 of 3)

Unakwik (229)				Coghill (223)			
Periods		Hours		Periods		Hours	
P/S	GN	Dates	Open	P/S	GN	Dates	Open
				25	31	08/28-08/31	84
				26	32	09/01-09/03	60
				27	33	09/04-09/07	84
				28	34	09/08-09/10	60
				29	35	09/11-09/14	84
				30	36	09/15-09/17	60
				31	37	09/20-09/21	36
				32	38	09/23-09/24	36
				33	39	09/27-09/28	36

^a Waters of the Coghill District south of 61° 00.00' N. latitude, excluding the Noerenberg Hatchery Terminal Harvest Area (THA) and Special Harvest Area (SHA), were open.

^b The Unakwik District was opened to commercial fishing and a schedule of two 24-hour periods per week was established beginning June 24. The schedule was from 8:00 p.m. Thursday until 8:00 p.m. Friday and from 8:00 a.m. Monday until 8:00 a.m. Tuesday.

^c Coghill District waters south of 60° 50.75' N. latitude, excluding the Noerenberg Hatchery THA and SHA, were open.

^d Effective 7:00 a.m., Monday, June 28, Unakwik District periods were concurrent with Coghill District periods.

^e Within the Coghill District, including the Noerenberg Hatchery THA, all waters within one nautical mile of the southern end of Esther Island were open. In addition, waters of Esther Passage within one nautical of Esther Island up to the latitude of the markers at Shoestring Cove at approximately 60° 50.75' N. latitude and on the west side of Esther Island above Esther rocks and south of 60° 50.75' N. latitude, waters within one nautical mile were open.

^f Coghill District waters south of 60° 50.75' N. latitude, excluding the Noerenberg Hatchery THA, and the waters of Esther Passage up to 60° 50.75' N. latitude and south of 60° 50.75' N. latitude on the west side of Esther Island were open.

^g Effective 7:30 p.m., Sunday July 4, all waters of the Coghill District, excluding the Noerenberg Hatchery SHA, were open. In addition, regulatory closed waters at Coghill Lagoon were not in effect. Closed waters in the lagoon were marked by a pair of buoys in the mouth of the Coghill River.

^h All waters of the Coghill District, including the Noerenberg Hatchery SHA to a line of buoys in front of the barrier seine, were open. Regulatory closed waters in Coghill Lagoon were not in effect.

-Continued-

ⁱ Effective 10:00 p.m., Tuesday, July 6, the openings in the Unakwik District reverted back to a schedule of two 24-hour periods per week. The schedule was from 8:00 p.m. Thursday until 8:00 p.m. Friday and from 8:00 a.m. Monday until 8:00 a.m. Tuesday.

^j Only the Noerenberg Hatchery SHA was open to seine gear.

^k All waters of the Coghill District, including the Noerenberg Hatchery SHA and THA to a line of buoys in front of the barrier seine, were open. Regulatory closed waters in Coghill Lagoon were not in effect.

^l All waters of the Coghill District, including the Noerenberg Hatchery SHA and THA to a line of buoys in front of the hatchery barrier seine, were open. Waters inside the yellow Salmon Harvest Task Force (SHTF) markers at the entrances to Pigot Bay, Hummer Bay, and Bettles Bay remained closed.

^m Waters of the Esther Subdistrict, including the Noerenberg Hatchery SHA and THA to a line of buoys in front of the hatchery barrier seine, were open.

ⁿ All waters of the Coghill District, excluding the Esther Subdistrict and waters inside the SHTF markers at the entrance to Pigot Bay, Hummer Bay, and Bettles Bay, were open.

^o The Unakwik District closed for the 1999 season at 8:00 p.m., Friday, September 3.

^p Waters of the Coghill District, excluding the Noerenberg Hatchery SHA and waters inside the yellow SHTF markers at the entrance to Pigot Bay, Hummer Bay, and Bettles Bay, were open.

^q Waters of the Coghill District, excluding the waters inside the yellow SHTF markers at the entrance to Pigot Bay, Hummer Bay, and Bettles Bay, were open.

^r Only the waters of the Noerenberg Hatchery THA and SHA were open.

^s The waters of the Esther Subdistrict, excluding the Noerenberg Hatchery THA and SHA, were open.

^t The Coghill District closed for the 1999 season at 8:00 p.m., Tuesday, September 28.

Appendix D.1. Commercial salmon harvest by period in the Eshamy District drift gillnet and set gillnet fisheries, Prince William Sound, 1999.

Period	Date ^{a,b}	Hours	Permits	Landings	Chinook		Sockeye		Coho		Pink		Chum	
					Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
DRIFT GILLNET														
01	07/15	36	46	84	3	39	4,038	25,233	183	1,215	2,755	9,211	4,878	38,952
02	07/19	36	23	52	15	200	3,186	21,377	212	1,535	4,166	14,539	2,677	21,586
03	07/22	36	23	38	1	12	3,173	21,766	196	1,489	2,451	7,857	1,454	11,820
04	07/26	36	31	51	3	39	5,296	34,595	237	1,790	4,742	15,295	1,779	14,315
05	07/29	36	23	49	1	29	5,614	33,820	56	428	4,344	15,133	893	7,429
06	08/02	36	42	90	3	31	7,329	46,656	229	1,663	10,763	37,174	693	5,261
07	08/05	36	63	124	1	18	11,583	73,803	507	3,419	15,943	56,958	623	4,713
08	08/09	36	37	53	0	0	3,700	23,007	34	268	1,866	5,960	50	406
09	08/12	36	33	62	0	0	4,972	29,443	29	251	7,971	26,686	31	254
10	08/16	36	23	52	0	0	6,104	35,675	47	385	7,565	26,799	14	125
11	08/19	36	20	50	0	0	7,077	42,191	44	365	7,901	27,849	8	64
12	08/23	36	29	56	1	6	6,246	37,313	44	391	13,581	47,300	8	67
13	08/26	36	25	53	0	0	7,364	43,740	24	215	17,486	56,580	7	61
14	08/30	36	19	32	2	30	4,935	28,703	105	905	11,617	39,677	5	44
15	09/02	36	17	27	0	0	2,419	14,247	29	269	8,542	27,454	0	0
16	09/06	36	13	21	0	0	2,996	17,011	60	505	5,389	16,187	0	0
Total		576	104	894	30	404	86,032	528,580	2,036	15,093	127,082	430,659	13,120	105,097
Average Weight						13.47		6.14		7.41		3.39		8.01
SET GILLNET														
01	07/15	36	17	49	103	743	3,725	22,804	87	610	825	2,681	2,039	16,951
02	07/19	36	20	45	9	155	5,141	32,403	352	2,647	4,565	14,827	3,679	30,009
03	07/22	36	18	50	3	52	5,251	34,467	135	993	2,357	8,173	1,714	13,896
04	07/26	36	16	41	3	44	5,103	32,577	131	958	2,450	8,061	1,416	11,380
05	07/29	36	18	40	7	98	8,144	50,244	56	427	2,731	10,221	986	8,262
06	08/02	36	18	57	2	35	17,700	108,690	119	878	3,430	12,543	719	5,781
07	08/05	36	15	39	1	25	4,602	27,881	124	922	4,759	16,686	462	3,859
08	08/09	36	15	27	0	0	4,513	27,846	25	202	652	2,277	35	310
09	08/12	36	9	18	0	0	2,887	17,088	21	192	2,213	8,218	20	156
10	08/16	36	9	15	1	15	5,685	33,989	18	147	3,046	10,250	11	102
11	08/19	36	6	12	0	0	3,615	21,886	14	110	4,568	14,948	15	113
12	08/23	36	7	11	2	17	2,762	16,599	3	20	4,044	12,478	0	0
13	08/26	36	4	11	0	0	2,607	15,582	4	29	4,349	13,403	4	40
14	08/30	36	4	10	0	0	2,618	15,664	3	24	3,334	10,144	1	10
15	09/02	36	1	1	0	0	25	142	0	0	120	446	0	0
Total		540	21	426	131	1,184	74,378	457,862	1,092	8,159	43,443	145,356	11,101	90,869
Average Weight						9.04		6.16		7.47		3.35		8.19
COMBINED GEAR														
01	07/15	36	63	133	106	782	7,763	48,037	270	1,825	3,580	11,892	6,917	55,903
02	07/19	36	43	97	24	355	8,327	53,780	564	4,182	8,731	29,366	6,356	51,595
03	07/22	36	41	88	4	64	8,424	56,233	331	2,482	4,808	16,030	3,168	25,716
04	07/26	36	47	92	6	83	10,399	67,172	368	2,748	7,192	23,356	3,195	25,695
05	07/29	36	41	89	8	127	13,758	84,064	112	855	7,075	25,354	1,879	15,691
06	08/02	36	60	147	5	66	25,029	155,346	348	2,541	14,193	49,717	1,412	11,042
07	08/05	36	78	163	2	43	16,185	101,684	631	4,341	20,702	73,644	1,085	8,572
08	08/09	36	52	80	0	0	8,213	50,853	59	470	2,518	8,237	85	716
09	08/12	36	42	80	0	0	7,859	46,531	50	443	10,184	34,904	51	410
10	08/16	36	32	67	1	15	11,789	69,664	65	532	10,611	37,049	25	227
11	08/19	36	26	62	0	0	10,692	64,077	58	475	12,469	42,797	23	177
12	08/23	36	36	67	3	23	9,008	53,912	47	411	17,625	59,778	8	67
13	08/26	36	29	64	0	0	9,971	59,322	28	244	21,835	69,983	11	101
14	08/30	36	23	42	2	30	7,553	44,367	108	929	14,951	49,821	6	54
15	09/02	36	18	28	0	0	2,444	14,389	29	269	8,662	27,900	0	0
16	09/06	36	13	21	0	0	2,996	17,011	60	505	5,389	16,187	0	0
Total		576	125	1,320	161	1,588	160,410	986,442	3,128	23,252	170,525	576,015	24,221	195,966
Average Weight						9.86		6.15		7.43		3.38		8.09

^a Starting date of period.

^b For area and opening times refer to Appendix D.9.

Appendix D.2. Commercial salmon catch by species in the Eshamy District,
Prince William Sound, 1985 - 1999.

CATCH BY SPECIES						
Year	Chinook	Sockeye	Coho	Pink	Chum	Total
DRIFT GILLNET						
1985	1	667	0	24,899	1,021	26,588
1986	0	4	1	938	65	1,008
1987	2	642	3	3,225	7,060	10,932
1988	94	50,868	794	348,873	206,060	606,689
1989 ^a						
1990	110	12,967	574	165,362	264,772	443,785
1991	107	296,234	468	44,516	202,183	543,508
1992	158	373,596	1,017	153,018	50,974	578,763
1993	8	80,807	673	45,974	27,045	154,507
1994	2	61,848	623	254,535	9,497	326,505
1995	21	29,851	1,468	60,712	13,284	105,336
1996	19	179,064	1,056	19,043	23,552	222,734
1997	17	475,498	426	146,324	34,768	657,033
1998	2	98,002	252	101,068	343	199,667
1999	30	86,032	2,036	127,082	13,120	228,300
Ten Year Average (1989-98)	49	178,652	729	110,061	69,602	359,093
SET GILLNET						
1985	1	3,439	74	33,284	1,295	38,093
1986	9	1,043	86	42,123	5,764	49,025
1987	31	5,387	336	86,677	45,099	137,530
1988	100	18,321	283	180,456	93,577	292,737
1989 ^a						
1990	56	10,204	532	369,589	94,494	474,875
1991	76	184,028	504	20,075	49,394	254,077
1992	101	144,568	1,242	390,097	4,695	540,703
1993	55	101,717	832	84,568	20,369	207,541
1994	9	97,664	628	311,134	6,908	416,343
1995	19	30,814	695	28,118	6,621	66,267
1996	13	132,268	309	16,648	9,276	158,514
1997	12	196,005	163	76,610	8,475	281,265
1998	1	25,533	91	33,916	214	59,755
1999	131	74,378	1,092	43,443	11,101	130,145
Ten Year Average (1989-98)	38	102,533	555	147,862	22,272	273,260
COMBINED GEAR						
1985	2	4,106	74	58,183	2,316	64,681
1986	9	1,047	87	43,061	5,829	50,033
1987	33	6,029	339	89,902	52,159	148,462
1988	194	69,189	1,077	529,329	299,637	899,426
1989 ^a						
1990	166	23,171	1,106	534,951	359,266	918,660
1991	183	480,262	972	64,591	251,577	797,585
1992	259	518,164	2,259	543,115	55,669	1,119,466
1993	63	182,524	1,505	130,542	47,414	362,048
1994	11	159,512	1,251	565,669	16,405	742,848
1995	40	60,665	2,163	88,830	19,905	171,603
1996	32	311,332	1,365	35,691	32,828	381,248
1997	29	671,503	589	222,934	43,243	938,298
1998	3	123,535	343	134,984	557	259,422
1999	161	160,410	3,128	170,525	24,221	358,445
Ten Year Average (1989-98)	87	281,185	1,284	257,923	91,874	632,353

^a Fishing was closed due to oil contamination on the beaches.

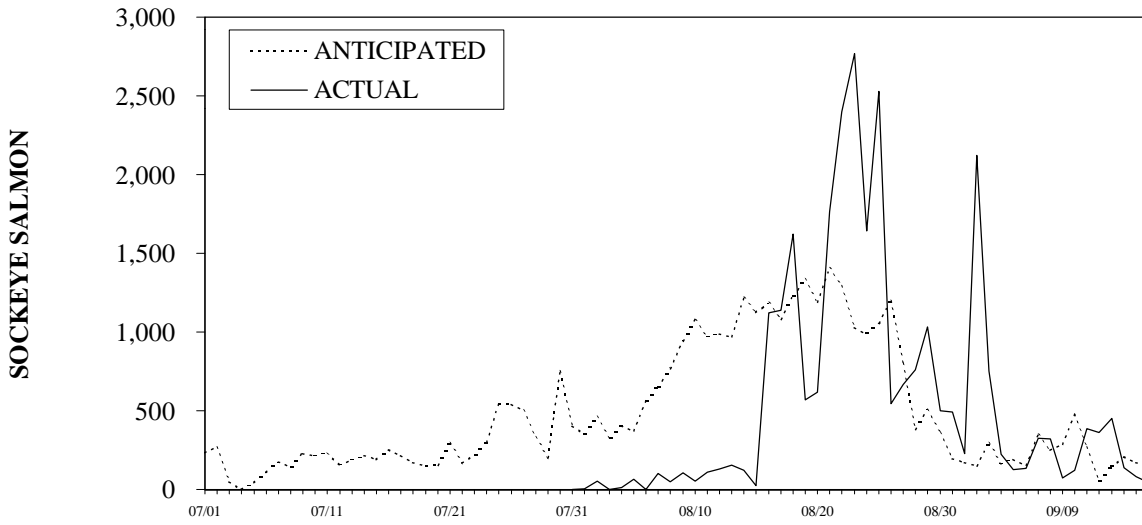
Appendix D.3. Daily salmon escapement through the Eshamy weir, Prince William Sound, 1999.

Date	Sockeye		Pink ^a		Chum		Coho		Chinook	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
07/02		0		0		0		0		0
07/03		0		0		0		0		0
07/04		0		0		0		0		0
07/05		0		0		0		0		0
07/06		0		0		0		0		0
07/07		0		0		0		0		0
07/08		0		0		0		0		0
07/09		0		0		0		0		0
07/10		0		0		0		0		0
07/11		0		0		0		0		0
07/12		0		0		0		0		0
07/13		0		0		0		0		0
07/14		0		0		0		0		0
07/15		0		0		0		0		0
07/16		0		0		0		0		0
07/17		0		0		0		0		0
07/18		0		0		0		0		0
07/19		0		0		0		0		0
07/20		0		0		0		0		0
07/21		0		0		0		0		0
07/22		0		0		0		0		0
07/23		0		0		0		0		0
07/24		0		0		0		0		0
07/25		0		0		0		0		0
07/26		0		0		0		0		0
07/27		0		0		0		0		0
07/28		0		0		0		0		0
07/29		0		0		0		0		0
07/30		0		0		0		0		0
07/31		0		0		0		0		0
08/01	4	4	0	0	0	0	0	0	0	0
08/02	52	56	0	0	0	0	0	0	0	0
08/03	2	58	0	0	0	0	0	0	0	0
08/04	14	72	0	0	0	0	0	0	0	0
08/05	66	138	0	0	0	0	0	0	0	0
08/06	0	138	0	0	0	0	0	0	0	0
08/07	102	240	0	0	0	0	0	0	0	0
08/08	47	287	1	1	1	1	0	0	0	0
08/09	107	394	2	3	0	1	0	0	0	0
08/10	52	446	2	5	0	1	0	0	0	0
08/11	110	556	1	6	0	1	0	0	0	0
08/12	131	687	6	12	0	1	0	0	0	0
08/13	155	842	4	16	0	1	0	0	0	0
08/14	122	964	7	23	0	1	0	0	0	0
08/15	23	987	2	25	0	1	0	0	0	0
08/16	1,121	2,108	42	67	0	1	0	0	0	0
08/17	1,140	3,248	139	206	0	1	0	0	0	0
08/18	1,623	4,871	184	390	0	1	0	0	0	0
08/19	570	5,441	124	514	0	1	0	0	0	0
08/20	616	6,057	236	750	0	1	0	0	0	0

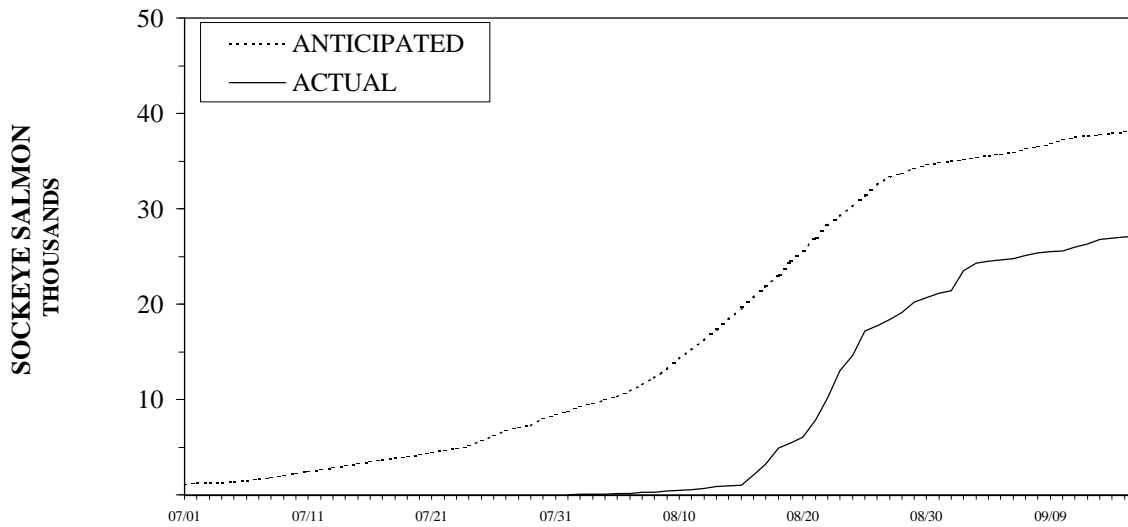
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1999 ESHAMY LAKE SOCKEYE ESCAPEMENT

Daily



CUMULATIVE



Appendix D.4. Anticipated daily and cumulative sockeye salmon escapement versus actual escapement past the Eshamy River weir, 1999.

Appendix D.5. Salmon escapement by species at the Eshamy weir, Prince William Sound, 1967-99.

Year	Escapement by Species ^a					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1967	0	10,821	192	10,433	1	21,447
1968	1	68,048	450	919	1	69,419
1969	0	61,196	96	3,095	2	64,389
1970	0	11,460	25	387	0	11,872
1971	0	954 ^b	97	3,179	0	4,230
1972 ^c		28,683				28,683
1973	0	10,202	205	1,698	0	12,105
1974 ^c		633				633
1975 ^c		1,724				1,724
1976 ^c		19,367				19,367
1977	0	11,746	230	32,080	0	44,056
1978	0	12,580	20	552	0	13,152
1979	0	12,169	5	3,654	1	15,829
1980	5	44,263	128	963	2	45,361
1981	1	23,048	249	5,956	13	29,267
1982	0	6,782	79	1,056	79	7,996
1983	0	10,348	40	7,047	4	17,439
1984	2	36,121	881	3,970	0	40,974
1985	0	26,178	96	6,271	0	32,545
1986	2	6,949	55	1,004	31	8,041
1987 ^d						
1988	2	31,747	48	1,205	1	33,003
1989	1	57,232	0	6,283	210	63,726
1990	0	14,477	43	2,209	5	16,734
1991	2	46,229	907	31,241	17	78,396
1992	1	36,237	52	3,004	5	39,299
1993	1	42,893	92	3,435	9	46,430
1994	1	64,660	1,184	12,061	87	77,993
1995	7	21,701	1,076	18,601	407	41,792
1996	2	5,271	108	7,959	9	13,349
1997	2	39,015	111	15,142	18	54,288
1998 ^d						
1999	1	27,057	194	32,756	3	60,011
10 Year Average (1989-1998)	2	36,413	397	11,104	85	48,001

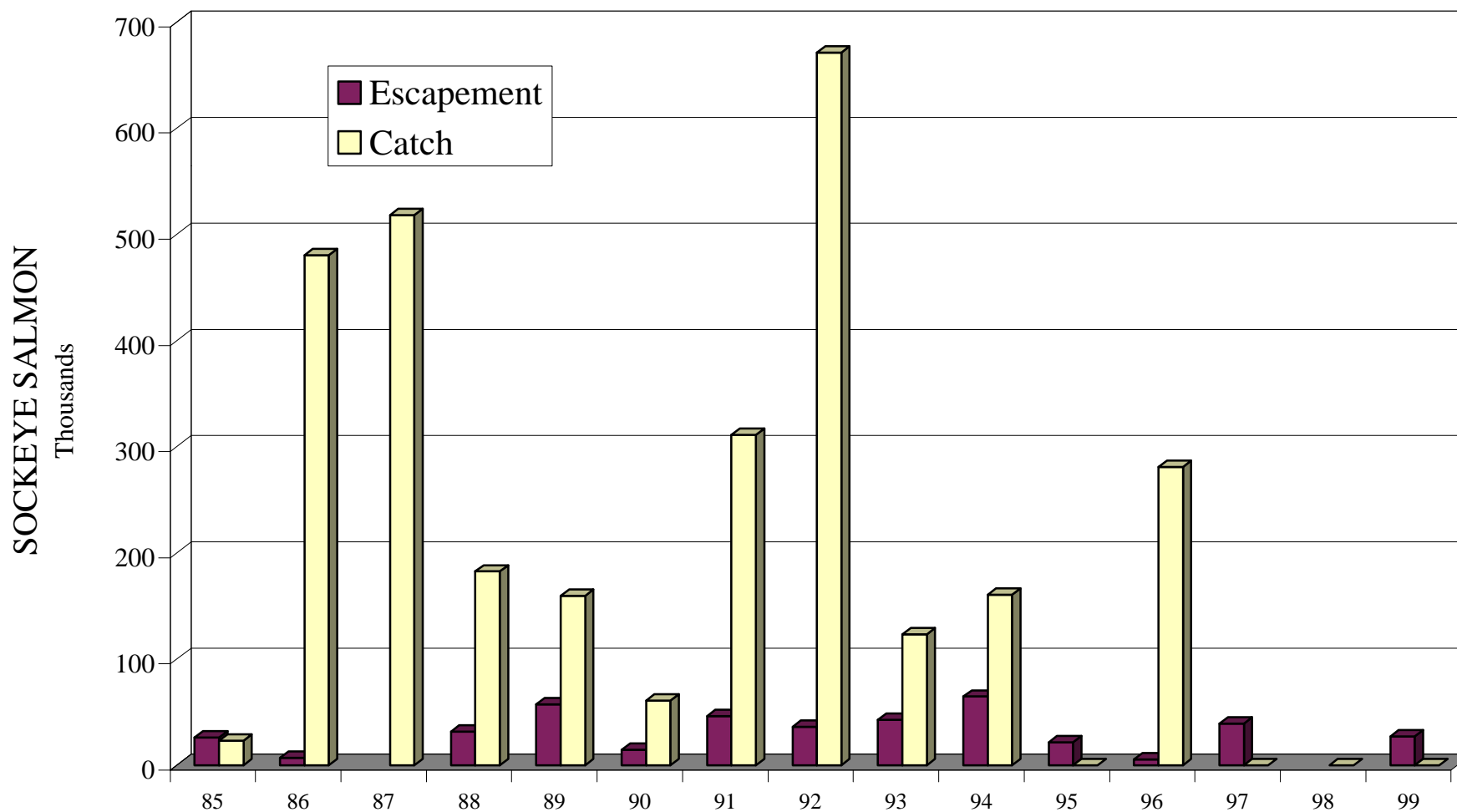
^a For break down of jacks versus adult sockeye see specific year's daily escapement enumeration table.

^b Enumeration low due to holes in weir. Actual escapement is estimated to be more than 3,000.

^c Incidental passage of salmon other than sockeye was not recorded for each year.

^d The Eshamy weir was not in operation during this year.

SOCKEYE SALMON CATCH AND ESCAPEMENT IN THE ESHAMY DISTRICT



Appendix D.6. Sockeye salmon catch and escapement in the Eshamy District, Prince William Sound, 1985 - 99.

Appendix D.7. Estimated age and sex composition of sockeye salmon harvested in the Eshamy District commercial common property gillnet fishery, 1999.

		Brood Year and Age Class				Total
		1995	1994		1993	
		1.2	1.3	2.2	2.3	
Stratum dates:	07/15 - 09/07					
Sampling dates:	08/05 - 08/07					
Sample size:	196					
Female	Percentage of sample	47.4	0.0	1.5	0.0	49.0
	Number in catch	76,113	0	2,455	0	78,568
Male	Percentage of sample	47.4	0.5	2.6	0.5	51.0
	Number in catch	76,113	818	4,092	818	81,842
Total	Percentage of sample	94.9	0.5	4.1	0.5	100.0
	Number in catch	152,226	818	6,547	818	160,410
	Standard error	2,528	818	2,273	818	

Appendix D.8. Temporally stratified age and sex composition of the sockeye salmon escapement through the Eshamy River weir, 1999.

		Brood Year and Age Class						Total
		1996	1995		1994		1993	
		1.1	1.2	2.1	1.3	2.2	2.3	
Stratum dates:	08/01 - 08/15							
Sampling dates:	08/02 - 08/11							
Sample size:	460							
Female	Percentage of sample	0.0	34.6	0.0	3.5	11.1	2.2	51.3
	Number in escapement	0	341	0	34	109	21	506
Male	Percentage of sample	1.7	28.7	0.2	3.3	13.3	1.5	48.7
	Number in escapement	17	283	2	32	131	15	481
Total	Percentage of sample	1.7	63.3	0.2	6.7	24.3	3.7	100.0
	Number in escapement	17	624	2	67	240	36	987
	Standard error	6	22	2	12	20	9	
Stratum dates:	08/16 - 08/24							
Sampling dates:	08/16 - 08/16							
Sample size:	441							
Female	Percentage of sample	0.0	35.1	0.0	1.4	15.4	1.4	53.3
	Number in escapement	0	4,797	0	186	2,104	186	7,272
Male	Percentage of sample	2.9	30.6	0.0	1.4	10.9	0.9	46.7
	Number in escapement	402	4,178	0	186	1,485	124	6,375
Total	Percentage of sample	2.9	65.8	0.0	2.7	26.3	2.3	100.0
	Number in escapement	402	8,974	0	371	3,590	309	13,647
	Standard error	110	309	0	106	286	97	
Stratum dates:	08/25 - 09/16							
Sampling dates:	08/27 - 08/28							
Sample size:	454							
Female	Percentage of sample	0.0	41.0	0.0	1.3	15.2	2.4	59.9
	Number in escapement	0	5,090	0	164	1,888	301	7,443
Male	Percentage of sample	2.4	24.4	0.2	1.1	10.6	1.3	40.1
	Number in escapement	301	3,037	27	137	1,313	164	4,980
Total	Percentage of sample	2.4	65.4	0.2	2.4	25.8	3.7	100.0
	Number in escapement	301	8,127	27	301	3,202	465	12,423
	Standard error	90	278	27	90	255	111	
Strata Combined:	08/01 - 09/16							
Sampling dates:	08/02 - 08/28							
Sample size:	1,355							
Female	Percentage of sample	0.0	37.8	0.0	1.4	15.2	1.9	56.3
	Number in escapement	0	10,227	0	384	4,102	508	15,221
Male	Percentage of sample	2.7	27.7	0.1	1.3	10.8	1.1	43.7
	Number in escapement	720	7,498	30	355	2,930	303	11,836
Total	Percentage of sample	2.7	65.5	0.1	2.7	26.0	3.0	100.0
	Number in escapement	720	17,726	30	739	7,032	811	27,057
	Standard error	142	416	27	139	384	147	

Appendix D.9. Summary of periods, dates, hours open, and emergency orders issued for the commercial salmon fisheries in the Eshamy District, Prince William Sound, 1999.

Main Bay Subdistrict (225-21)			Crafton Island Subdistrict (225-10, 20, 30)			Emergency Orders Issued
Periods	Dates	Hours Open	Periods	Dates	Hours Open	
01	07/15-07/16	36	01	07/15-07/16	36	2-F-E-42-99 ^a
02	07/19-07/20	36	02	07/19-07/20	36	2-F-E-46-99 ^a
03	07/22-07/23	36	03	07/22-07/23	36	2-F-E-55-99 ^a
04	07/26-07/27	36	04	07/26-07/27	36	2-F-E-55-99 ^a
05	07/29-07/30	36	05	07/29-07/30	36	2-F-E-56-99 ^a
06	08/02-08/03	36	06	08/02-08/03	36	2-F-E-61-99 ^a
07	08/05-08/06	36	07	08/05-08/06	36	2-F-E-65-99 ^u
08	08/09-08/10	36				2-F-E-71-99 ^c
09	08/12-08/13	36				2-F-E-72-99 ^u
10	08/16-08/17	36				2-F-E-73-99 ^c
11	08/19-08/20	36				2-F-E-80-99 ^u
12	08/23-08/24	36				2-F-E-81-99 ^c
13	08/26-08/27	36				2-F-E-82-99 ^{u,c}
14	08/30-08/31	36				2-F-E-82-99 ^c
15	09/02-09/03	36				2-F-E-82-99 ^u
16	09/06-09/07	36				2-F-E-89-99 ^t
17	09/09-09/10	36				2-F-E-93-99 ^g

^a Waters of the Main Bay Subdistrict, excluding the Alternating Gear Zone (AGZ) and in the Crafton Island Subdistrict, waters north of the anadromous stream marker on the northern shore of Loomis Creek, were open. Anadromous stream closures within the Main Bay Subdistrict were not in effect.

^b Waters of the Main Bay Subdistrict, including the AGZ and the Crafton Island Subdistrict, north of the anadromous stream marker on the northern shore of Loomis Creek, were open. The AGZ was open to drift gillnet gear.

^c Waters of the Main Bay Subdistrict, including the AGZ, were open. Waters of the AGZ were open to set gillnet gear.

^d Waters of the Main Bay Subdistrict, including the AGZ, were open. Waters of the AGZ were open to drift gillnet gear.

^e The Main Bay Subdistrict went on a schedule of two 36-hour periods per week. The periods were from 8:00 a.m., Thursdays to 8:00 p.m. Fridays and from 8:00 a.m., Mondays to 8:00 p.m. Tuesdays. The AGZ was set to open to drift gillnet gear during all Thursday-Friday 36-hour periods and to set gillnet gear during all Monday-Tuesday 36-hour periods.

^t Effective 2:00 p.m. Tuesday, September 7, drift gillnet gear was allowed to fish in the AGZ in the absence of set gillnet gear.

^g The Eshamy District closed for the season effective 8:00 p.m. Tuesday, September 14.

Appendix E.1. Prince William Sound commercial purse seine salmon harvest by day, 199

Catch Date	Chinook				Sockeye		Coho		Pink		Chum	
	Permits	Landings	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
06/05 ^a	3	4	0	0	0	0	0	0	0	0	5,601	46,345
06/06 ^a	1	1	0	0	0	0	0	0	0	0	1,165	10,487
06/07 ^a	5	5	5	129	0	0	0	0	0	0	3,738	33,819
06/08 ^a	7	7	1	26	0	0	0	0	0	0	5,009	42,500
06/10 ^a	9	9	9	82	1	5	0	0	0	0	4,709	39,927
06/11 ^a	4	4	0	0	0	0	0	0	0	0	1,398	12,669
06/12 ^a	7	7	15	281	0	0	0	0	0	0	2,539	23,454
06/13 ^a	4	4	2	41	1	4	0	0	0	0	843	7,375
06/14 ^a	9	9	0	0	0	0	0	0	0	0	3,602	31,669
06/15 ^a	3	3	6	93	5	24	0	0	0	0	2,207	17,653
06/16 ^a	8	9	10	170	2	10	0	0	0	0	9,342	77,910
06/17 ^a	7	7	9	122	4	24	0	0	0	0	8,686	73,411
06/18 ^a	10	10	2	13	0	0	0	0	0	0	6,551	59,829
06/19 ^a	10	11	23	212	1	6	0	0	0	0	19,852	178,099
06/20 ^a	15	16	15	221	0	0	0	0	0	0	37,785	327,539
06/21 ^a	17	18	6	97	15	98	0	0	8	32	25,400	213,743
06/22 ^a	20	20	7	105	9	56	2	18	12	48	21,304	185,239
06/23 ^a	23	23	6	133	1	6	0	0	1	3	30,418	254,021
06/24 ^a	16	16	2	50	0	0	1	13	0	0	20,475	174,942
06/25 ^a	20	20	7	121	0	0	0	0	63	233	19,244	161,667
06/26 ^a	12	12	2	45	0	0	0	0	221	742	19,380	151,886
06/27 ^a	17	17	7	111	0	0	0	0	207	752	18,211	150,024
06/28 ^a	14	14	2	12	0	0	0	0	319	1,062	26,702	215,550
06/29 ^a	24	26	10	145	20	120	0	0	498	1,590	56,045	480,226
06/30 ^a	15	15	1	18	0	0	0	0	216	697	31,287	239,817
07/01 ^a	14	14	1	11	0	0	1	7	42	144	18,478	148,909
07/02 ^b	19	21	3	38	389	2,518	0	0	505	1,686	29,152	250,108
07/03 ^a	13	13	0	0	1	7	0	0	140	449	23,221	200,569
07/04 ^a	17	17	2	15	0	0	0	0	0	0	25,497	211,731
07/05 ^a	13	13	0	0	0	0	0	0	106	339	14,992	123,295
07/06 ^c	63	97	4	52	634	3,850	22	152	740,314	2,478,958	22,763	188,630
07/07 ^a	9	9	0	0	0	0	0	0	4,036	12,617	17,117	140,471
07/08 ^a	11	11	1	25	2	8	0	0	719	2,534	16,383	127,613
07/09 ^a	4	5	0	0	0	0	0	0	120	383	7,352	62,549
07/10 ^d	87	137	5	77	613	3,541	33	236	929,624	2,998,388	154,025	1,206,673
07/11 ^a	4	9	0	0	0	0	0	0	49	164	23,446	171,615
07/12 ^e	94	165	3	18	610	3,626	50	356	1,321,841	4,312,834	132,961	1,020,592
07/13 ^a	3	3	0	0	0	0	0	0	126	405	10,588	90,432
07/14 ^f	95	150	4	53	541	3,167	76	592	1,257,305	3,986,479	110,611	888,955
07/15 ^g	4	4	0	0	0	0	0	0	48	302	10,977	93,315
07/16 ^h	96	156	28	344	377	2,227	24	188	1,487,295	4,736,653	92,598	738,578
07/18 ⁱ	101	174	2	31	215	1,232	19	145	1,340,156	4,205,319	50,751	386,688
07/20 ^j	104	146	8	64	715	4,334	139	1,091	856,843	2,654,976	91,661	725,887
07/22 ^k	99	120	10	197	1,455	9,223	201	1,501	653,664	2,078,560	53,314	419,474
07/25 ^l	99	120	2	16	1,312	7,729	170	1,349	688,007	2,181,090	53,521	440,574
07/27 ^m	98	106	26	397	1,347	8,012	429	3,459	601,448	1,834,356	23,252	187,851
07/29 ⁿ	94	102	4	99	1,216	7,145	335	2,242	607,626	1,913,515	27,674	228,211
07/30 ^o	15	16	0	0	218	1,275	62	488	96,971	290,390	5,858	43,887
07/31 ^p	98	108	7	143	683	4,034	270	1,977	630,669	1,950,946	22,198	183,020
08/01 ^q	10	10	2	25	46	251	11	97	36,269	108,948	395	2,995
08/02 ^r	115	129	29	510	1,651	9,335	705	4,947	943,038	2,801,174	6,494	54,189
08/04 ^s	116	132	7	135	2,561	14,319	1,101	7,561	1,245,363	3,735,111	8,464	67,015
08/05 ^t	5	6	0	0	133	671	13	95	108,285	296,507	124	872
08/06 ^u	123	137	7	157	1,326	7,507	749	5,491	1,071,586	3,269,832	10,248	86,426
08/07 ^v	15	15	0	0	162	958	46	287	120,777	367,476	169	1,239
08/08 ^w	124	167	161	1,683	1,440	8,371	2,268	17,181	1,628,755	4,842,039	4,706	39,634
08/09 ^w	27	31	1	21	156	893	118	841	225,043	640,713	13,285	118,146
08/10 ^x	122	158	3	23	1,998	11,263	876	6,796	1,456,493	4,258,571	4,073	29,966
08/12 ^y	124	173	1	10	1,228	6,883	972	7,244	1,834,525	5,377,431	628	5,063
08/14 ^z	124	164	1	15	1,219	7,075	536	4,171	1,791,066	5,199,699	607	5,068
08/16 ^{aa}	125	172	0	0	623	3,751	436	3,224	1,889,256	5,524,165	191	1,511
08/18 ^{aa}	113	145	0	0	603	3,557	531	4,194	1,529,188	4,551,052	374	3,170

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Appendix E.1. (continued)

	Chinook				Sockeye		Coho		Pink		Chum	
Date	Permits	Landings	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds	Numbers	Pounds
08/20 ^{ab}	113	127	1	6	481	2,753	349	2,800	1,335,474	3,970,721	108	932
08/22 ^{cc}	64	73	0	0	362	2,150	416	3,147	788,794	2,243,550	88	680
08/24 ^{cc}	51	61	1	9	254	1,412	214	1,658	749,524	2,085,096	44	357
08/25 ^{dd}	10	11	0	0	124	742	111	853	196,610	546,154	10	74
08/26 ^{dd}	15	16	0	0	73	411	4,946	41,933	172,094	509,066	750	6,161
08/27 ^{dd}	16	19	1	5	36	215	5,532	48,219	235,605	645,656	878	7,495
08/28 ^{ee}	14	14	1	12	17	107	5,138	40,173	150,194	416,741	342	2,873
08/29 ^{ff}	6	7	0	0	0	0	0	0	201,096	596,619	0	0
08/30 ^{ff}	12	13	2	21	12	63	7,073	71,389	168,290	458,272	450	3,826
08/31 ^{ff}	11	12	0	0	16	88	1,319	10,864	248,037	706,783	47	394
09/01 ^{gg}	3	3	0	0	0	0	102	975	46,947	136,143	1	10
09/02 ^{gg}	10	11	0	0	0	0	2,340	25,625	126,233	340,382	185	1,608
09/03 ^{gg}	6	6	0	0	1	8	151	1,392	113,724	319,547	6	45
09/04 ^{hh}	5	5	0	0	0	0	0	0	116,028	397,223	0	0
09/05 ^{hh}	4	4	0	0	0	0	8	54	139,655	389,129	2	6
09/06 ^{hh}	5	5	0	0	2	11	116	950	89,692	253,972	12	94
09/07 ^{hh}	3	3	0	0	0	0	0	0	60,000	210,000	0	0
09/08 ⁱⁱ	15	19	0	0	3	19	15,274	125,886	125,934	342,104	137	1,076
09/09 ⁱⁱ	9	9	0	0	0	0	13,629	117,972	75,746	208,300	0	0
09/10 ⁱⁱ	10	10	0	0	0	0	10,580	95,434	77,443	212,967	0	0
09/11 ^{jj}	3	3	0	0	0	0	0	0	99,775	274,381	0	0
09/12 ^{jj}	5	6	0	0	0	0	0	0	148,361	408,327	0	0
09/13 ^{kk}	2	2	0	0	0	0	0	0	49,387	135,815	0	0
09/14 ^{kk}	4	4	0	0	0	0	61	628	54,512	150,823	0	0
09/15 ^{ll}	3	3	0	0	0	0	0	0	88,637	246,450	0	0
09/16 ^{mm}	1	1	0	0	0	0	0	0	72,170	198,467	0	0
09/17 ^{mm}	2	2	0	0	0	0	0	0	38,888	110,850	0	0
09/18 ⁿⁿ	3	3	0	0	0	0	0	0	95,848	266,944	0	0
09/19 ⁿⁿ	1	1	0	0	0	0	0	0	78,724	214,690	0	0
09/20 ^{oo}	3	3	0	0	0	0	0	0	144,916	402,769	0	0
09/21 ^{oo}	1	1	0	0	0	0	0	0	14,290	41,443	0	0
09/22 ^{oo}	1	1	0	0	0	0	0	0	73,978	203,439	0	0
09/23 ^{oo}	2	2	0	0	0	0	0	0	104,652	294,151	0	0
09/25 ⁿⁿ	1	2	0	0	0	0	0	0	19,666	57,034	0	0
09/27 ^{oo}	1	1	0	0	0	0	0	0	13,215	38,326	0	0
Totals	139	3,905	475	6,439	24,914	145,094	77,555	665,895	31,412,982	94,651,698	1,472,701	11,930,353
Average Weight				13.56		5.82		8.59		3.01		8.10

^a Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Reg and anadromous salmon stream closures were not in effect

^b Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Reg and anadromous salmon stream closures were not in effect
The entire Unakwik District was open. All anadromous stream closures remained in effect.

^c Eastern District waters south of a line from Entrance Point to Potato Point were open. The water east of a line from Potato Point to the yellow Salmon Harvest Task Force (SHTF) marker at Tongue Point, and waters of Galena Bay east of the yellow SHTF markers in the narrows we All anadromous salmon stream closures remained in effect.

Boundaries were amended at 12:00 noon as follows: the waters of Jack Bay east of a line from l to the yellow SHTF marker at Tongue Point were closed. All other previously announced bound remained in effect.

Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Reg and anadromous salmon stream closures were not in effect

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Appendix E.1. (continued)

- ^d Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters east of a line from Entrance Point to the yellow regulatory marker at Tongue Point, and waters east of the yellow SHTF markers in the narrows were closed.
In the Coghill District, only the waters of the Wally Noerenberg Hatchery (WNH) Special Harvest Area (SHA) were open.
Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were not in effect.
- ^e Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed.
In the Coghill District, only the waters of the WNH SHA were open.
Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were not in effect.
- ^f Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters east of a line from Entrance Point to the yellow regulatory marker at Tongue Point, and waters east of the yellow SHTF markers in the narrows were closed.
In the Coghill District, only the waters of the WNH SHA were open.
Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.
- ^g Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.
- ^h Eastern District waters north of a line from Entrance Point to Potato Point and west of 146° 22.0' W. longitude were open. The waters of Jack Bay, east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows were closed. At 12:00 noon the Entrance Point to Potato Point boundary line was no longer in effect. Waters of the Eastern District south of the Entrance Point - Potato Point line were open.
In the Coghill District, only the waters of the WNH SHA were open.
Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.
Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.
- ⁱ Eastern District waters north of a line from Entrance Point to Potato Point and west of 146° 22.0' W. longitude were open. The waters of Jack Bay, east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed. At 2:00 p.m. the Entrance Point to Potato Point boundary line was no longer in effect. Waters of the Eastern District south of the Entrance Point - Potato Point line were open.
In the Coghill District, only the waters of the WNH SHA were open.
Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.

Appendix E.1. (continued)

^j Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay, east of the yellow SHTF markers in the narrows, were closed.

In the Coghill District, only the waters of the WNH SHA were open.

Within the Southwestern District, only the waters of the Armin F. Koenig (AFK) Hatchery SHA were open.

Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.

^k Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters east of a line from Entrance Point to the yellow SHTF marker at Tongue Point, and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed.

All waters of the Coghill District, including the WNH Terminal Harvest Area (THA) and SHA to a line of buoys in front of the hatchery barrier seine were open, except that Pigot, Hummer and Bettles Bay west of the SHTF markers at the entrance to the bays.

Within the Southwestern District, only the waters of the AFK Hatchery SHA were open.

Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.

^l Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters east of a line from Entrance Point to the yellow SHTF marker at Tongue Point, and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

In the Esther Subdistrict only the waters of the WNH THA and SHA, up to a line of buoys in front of the hatchery barrier seine, were open.

Within the Southwestern District, only the waters of the AFK Hatchery SHA were open.

Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.

^m Eastern District waters west of 146° 22.67' W. longitude were open.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

All waters of the Coghill District, including the WNH THA and SHA to a line of buoys in front of the hatchery barrier seine were open, except that Pigot, Hummer and Bettles Bay west of the SHTF markers at the entrance to the bays.

Waters of the Port San Juan Subdistrict, Point Elrington Subdistrict and AFK THA were open.

Open waters included the entire Southeastern District. All anadromous salmon stream closures were in effect.

Appendix E.1. (continued)

ⁿ Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' were open for the entire period. At 8:00 a.m. Thursday, July 29, the Eastern District south of the to Potato Point line was open until 8:00 p.m. the same day. The waters of Jack Bay, east of the SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and Galena Bay, east of the yellow SHTF markers in the narrows, were closed.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

Waters of the Port San Juan Subdistrict, Point Elrington Subdistrict and AFK THA were open.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^o Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' were open for the entire period. At 8:00 a.m. Thursday, July 29, the Eastern District south of the to Potato Point line was open until 8:00 p.m. the same day. The waters of Jack Bay, east of the SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and Galena Bay, east of the yellow SHTF markers in the narrows, were closed.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

^p Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' were open for the entire period. At 8:00 a.m. Saturday, July 31, the Eastern District south of the to Potato Point line was open until 8:00 p.m. the same day.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Montague District, waters east of line from Gilmour Point to the east end of Wilby Island Regulatory waters and anadromous salmon stream closures were not in effect.

Within the Southeastern District only the waters west of the longitude of Middle Ground buoy were open.

All anadromous salmon stream closures remained in effect.

^q Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' were open for the entire period. At 8:00 a.m. Saturday, July 31, the Eastern District south of the to Potato Point line was open until 8:00 p.m. the same day.

Appendix E.1. (continued)

^r Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows, waters of Sawmill Bay west of the yellow SHTF markers at the entrance to the bay were closed.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Simpson Bays west of the SHTF markers at the entrance to the bays.

Waters of the Port San Juan and Point Elrington Subdistricts were open.

Within the Southeastern District only the waters west of the longitude of Middle Ground buoy were open.

All anadromous salmon stream closures remained in effect.

^s Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows, waters of Sawmill Bay west of the yellow SHTF markers at the entrance to the bay were closed. Simpson Bay regulatory closed waters west of the longitude of Bomb Point were open.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Simpson Bays west of the SHTF markers at the entrance to the bays.

Waters of the Port San Juan and Point Elrington Subdistricts were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^t Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Simpson Bays west of the SHTF markers at the entrance to the bays.

^u Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows, waters of Sawmill Bay west of the yellow SHTF markers at the entrance to the bay were closed. Simpson Bay regulatory closed waters west of the longitude of Bomb Point were open.

Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Simpson Bays west of the SHTF markers at the entrance to the bays.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

Appendix E.1. (continued)

^v Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay west of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay, waters of Galena Bay, east of the yellow SHTF markers in the narrows and Sawmill Bay west of the yellow SHTF markers at the entrance to the bay, were closed.

Waters of the Northern District east of the longitude of the yellow SHTF (Salmon Harvest Task Force) marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of the yellow SHTF marker and waters south of the latitude of the southern most yellow SHTF marker in Siwash Bay located at approximately 60° 56.964' N. latitude were open. Waters inside of the yellow SHTF markers at the entrances to Granite Bay, Cedar Bay, and Wells Bay were closed. All anadromous salmon stream closures remained in effect.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Elrington Subdistricts west of the SHTF markers at the entrance to the bays.

Waters of the Port San Juan and Point Elrington Subdistricts were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^w Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay west of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay, waters of Galena Bay, east of the yellow SHTF markers in the narrows and Sawmill Bay west of the yellow SHTF markers at the entrance to the bay, were closed.

Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Elrington Subdistricts west of the SHTF markers at the entrance to the bays.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^x Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay west of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay, waters of Galena Bay, east of the yellow SHTF markers in the narrows and Sawmill Bay west of the yellow SHTF markers at the entrance to the bay, were closed.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters south of the latitude of the southern most yellow SHTF marker in Siwash Bay located at approximately 60° 56.964' N. latitude and waters of the Perry Island Subdistrict were open. Waters inside of the yellow SHTF markers at the entrances to Granite Bay, Cedar Bay, and Wells Bay were closed. All anadromous salmon stream closures remained in effect. Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Elrington Subdistricts west of the SHTF markers at the entrance to the bays.

Waters of the Point Elrington Subdistrict were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

Appendix E.1. (continued)

^y Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay, the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay, the waters of Galena Bay, east of the yellow SHTF markers in the narrows and Sawmill Bay west of the yellow SHTF markers at the entrance to the bay, were closed.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellet Point 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters inside of the yellow SHTF markers at the entrances to Granite Bay, Jonah Bay, Siwash Bay, and Wells Bay were closed. All anadromous salmon stream closures remained in effect. Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the Point Elrington and Port San Juan Subdistricts, within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° and north of the latitude of Point Helen were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^z Eastern District waters south of latitude of Middle Rock light were open.

All regulatory waters and anadromous salmon stream closures remained in effect.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellet Point 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside of the yellow SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay were closed. All anadromous stream closures remained in effect.

The waters of the Coghill District were open, excluding the WNH THA and SHA and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the Point Elrington and Port San Juan Subdistricts, within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° and north of the latitude of Point Helen were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^{aa} Eastern District waters south of latitude of Middle Rock light were open.

All regulatory waters and anadromous salmon stream closures remained in effect.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellet Point 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside of the yellow SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay were closed. All anadromous stream closures remained in effect.

The waters of the Coghill District were open, excluding the WNH SHA and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the Point Elrington and Port San Juan Subdistricts, within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° and north of the latitude of Point Helen were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

Appendix E.1. (continued)

^{bb} Eastern District waters south of latitude of Middle Rock light were open.

All regulatory waters and anadromous salmon stream closures remained in effect.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay. All anadromous stream closures remained in effect.

The waters of the Coghill District were open, excluding the WNH SHA and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the AFK THA, Point Elrington and Port San Juan Subdistricts and waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island 60° 20' N. latitude and north of the latitude of Point Helen were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^{cc} Eastern District waters south of latitude of Middle Rock light were open.

All regulatory waters and anadromous salmon stream closures remained in effect.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay. All anadromous stream closures remained in effect.

The waters of the Coghill District were open, excluding the WNH SHA and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest shore of Point Helen to the latitude of Squire Point were open.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

^{dd} Eastern District waters south of a line from Entrance Point to Potato Point were open.

All regulatory waters and anadromous salmon stream closures remained in effect.

Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay. All anadromous stream closures remained in effect.

The waters of the Coghill District were open, excluding the WNH SHA and Pigot, Hummer and west of the SHTF markers at the entrance to the bays.

In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest shore of from Point Helen to the latitude of Squire Point were open. Effective 8:00 a.m., Thursday, Aug open was expanded to include the AFK SHA.

Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

Appendix E.1. (continued)

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- ¹⁰ Eastern District waters south of a line from Entrance Point to Potato Point were open. All regulatory waters and anadromous salmon stream closures remained in effect. In addition, the Solomon Gulch Hatchery SHA was open for four hours. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay. All anadromous stream closures remained in effect. The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHTF at the entrance to the bays, were open. In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest Knight Island from Point Helen to the latitude of Squire Point were open. Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect. Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.
- ¹¹ Eastern District waters south of a line from Entrance Point to Potato Point were open. All regulatory waters and anadromous salmon stream closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside SHTF markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay. All anadromous stream closures remained in effect. The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHTF at the entrance to the bays, were open. In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest Knight Island from Point Helen to the latitude of Squire Point were open. Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect. Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.

Appendix E.1. (continued)

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- ^{8g} Eastern District waters south of a line from Entrance Point to Potato Point were open. All regulatory waters and anadromous salmon stream closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and Perry Island Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, were closed. All anadromous stream closures remained in effect. At 8:00 a.m., Thursday September 1, 2010, Cannery Creek Hatchery THA and SHA were opened. The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHI at the entrance to the bays, were open. In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest Knight Island from Point Helen to the latitude of Squire Point were open. Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect. Open waters included the entire Southeastern District. All anadromous salmon stream closures remained in effect.
- ^{8h} Eastern District waters south of a line from Entrance Point to Potato Point were open. All regulatory waters and anadromous salmon stream closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters inside the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay were closed. All anadromous stream closures remained in effect. The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHI at the entrance to the bays, were open. In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest Knight Island from Point Helen to the latitude of Squire Point were open.
- ⁸ⁱ Eastern District waters south of a line from Entrance Point to Potato Point and west of a line from the grain elevators on the north shore of Port Valdez to the brown oil boom container van station shoreline between Solomon Gulch Hatchery and Allison were open. All waters of the of the Valdez Harbor and all waters within 50 yards of the entrance to the harbor were closed. All regulatory waters and anadromous salmon stream closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters inside the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek Hatchery THA and SHA were opened. All anadromous stream closures remained in effect. The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHI at the entrance to the bays, were open. In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and A and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest Knight Island from Point Helen to the latitude of Squire Point were open.
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Appendix E.1. (continued)

- ^{jj} Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. Waters of the Perry Island Subdistrict and inside the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek were closed. All anadromous stream closures remained in effect. In the Coghill District, only the waters of the WNH SHA and THA were open. Within the Southwestern District, only the waters of the AFK THA and SHA were open.
- ^{kk} Eastern District waters west of a line from the longitude of the grain elevators on the north shore of Port Valdez to the brown oil boom container van stationed on the shoreline between Solomon Hatchery and Allison were open. All waters of the of the Valdez small boat harbor and all waters 50 yards of the entrance to the harbor were closed. All regulatory waters and anadromous salmon closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. Waters of the Perry Island Subdistrict and inside the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek were closed. All anadromous stream closures remained in effect. In the Coghill District, only the waters of the WNH SHA and THA were open. Within the Southwestern District, only the waters of the AFK THA and SHA were open.
- ^{ll} Eastern District waters west of a line from the longitude of the grain elevators on the north shore of Port Valdez to the brown oil boom container van stationed on the shoreline between Solomon Hatchery and Allison were open. All waters of the of the Valdez small boat harbor and all waters 50 yards of the entrance to the harbor were closed. All regulatory waters and anadromous salmon closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. Waters of the Perry Island Subdistrict and inside the yellow SHTF markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek were closed. All anadromous stream closures remained in effect. Within the Southwestern District, only the waters of the AFK THA and SHA were open.
- ^{mmm} Eastern District waters north of latitude of Middle Rock light were open. All regulatory waters and anadromous salmon stream closures remained in effect. Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. The waters of the Esther Subdistrict, excluding the WNH THA and SHA, were open. Within the Southwestern District, only the waters of the AFK THA and SHA were open.
- ⁿⁿ Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. Within the Southwestern District, only the waters of the AFK THA and SHA were open.
- ^{oo} Waters of the Northern District east of the longitude of the yellow SHTF marker near Pellew Pt approximately 147° 40.271'W. longitude and waters west of the longitude of Granite Point were closed. The waters of the Esther Subdistrict, excluding the WNH THA and SHA, were open. Within the Southwestern District, only the waters of the AFK THA and SHA were open.

Appendix E.2. Commercial salmon harvest by species, all gear and districts combined, Prince William Sound, 1971 - 1999.

CATCH BY SPECIES						
Year ^a	Chinook	Sockeye	Coho	Pink	Chum	Total
1971	3,551	88,368	30,551	7,310,964	574,265	8,007,699
1972 ^b	547	197,526	1,634	54,783	45,370	299,860
1973	2,405	124,802	1,399	2,056,878	729,839	2,915,323
1974 ^b	1,590	129,366	801	448,773	88,544	669,074
1975	2,519	189,613	6,142	4,452,805	100,479	4,751,558
1976	1,044	112,809	6,171	3,018,991	370,478	3,509,493
1977	648	310,358	843	4,513,082	572,610	5,397,541
1978	1,042	222,083	1,495	2,913,721	485,147	3,623,488
1979	2,015	150,040	6,843	15,607,620	326,414	16,092,932
1980	189	189,816	2,952	14,157,057	482,016	14,832,030
1981	404	251,222	4,383	20,524,470	1,878,716	22,659,195
1982	255	1,055,099	24,362	20,396,222	1,335,368	22,811,306
1983	1,048	92,111	10,496	14,038,796	1,041,309	15,183,760
1984	489	311,955	12,420	22,086,806	1,201,842	23,613,512
1985	1,104	493,278	19,753	25,056,663	1,280,093	26,850,891
1986	1,330	488,715	12,277	11,407,271	1,683,049	13,592,642
1987	874	540,109	47,751	29,198,507	1,904,494	31,691,735
1988	1,037	183,572	75,709	11,817,323	1,832,114	13,909,755
1989	1,113	140,090	203,574	21,860,582	995,962	23,201,321
1990	447	58,497	234,525	44,163,479	959,838	45,416,786
1991	445	507,815	145,311	37,134,311	331,906	38,119,788
1992	1,475	780,932	202,311	8,635,448	328,568	9,948,734
1993	2,148	418,948	48,310	5,761,436	1,173,341	7,404,183
1994	1,376	334,183	121,518	36,874,188	1,039,095	38,370,360
1995	1,364	230,057	140,314	16,045,396	702,216	17,119,347
1996	700	606,525	172,448	26,036,570	2,077,996	28,894,239
1997	1,186	1,197,776	64,360	25,828,078	2,224,725	29,316,125
1998	2,013	365,591	74,105	28,664,281	1,266,887	30,372,877
1999	1,055	339,037	81,841	44,993,247	2,963,838	48,379,018
Ten Year Average (1989-98)	1,227	464,041	140,678	25,100,377	1,110,053	26,816,376

^a Includes purse seine, drift gillnet and set gillnet catches from all P.W.S. fishing districts; Eastern, Northern, Unakwik, Coghill, Northwestern, Eshamy, Southwestern, Montague and Southeastern. Also includes hatchery sales harvests confiscated fish, donated and discarded fish catch, the surimi study fish, and special use educational permit catches.

^b General purse seine season closed.

Appendix E.3. Commercial pink salmon harvest for all gear types, by district, Prince William Sound, 1975-2000 (includes purse seine, drift gillnet, and set gillnet catches from all Prince William Sound districts; Unakwik catches are included in the Northern District. Does not include hatchery cost recovery, confiscated and test fish harvests).

Year	DISTRICT								Total
	Eastern	Northern	Coghill	Northwestern	Eshamy	Southwestern	Montague	Southeastern	
1975	712,328	171,657	303,597	420,891		1,673,887	118,467	875,456	4,276,283
1976	1,380,943	384,267	217,696	207,190		589,458		82,366	2,861,920
1977	1,673,044	147,964	230,215	208,727		930,469	77,104	824,374	4,091,897
1978	1,516,076	933,013	13,059					216,696	2,678,844
1979	4,500,032	115,886	38,560	59,423		5,111,073	1,347,413	4,160,925	15,333,312
1980	3,140,134	1,271,177	134,876	306,109		7,507,776	950	1,271,389	13,632,411
1981	4,797,583	1,194,621	34,155	46,874		10,371,220	278,879	3,221,268	19,944,600
1982	2,959,601	2,331,903	1,000,524	520,972	3,997	10,801,771	6,444	747,116	18,372,328
1983	2,430,063	1,021,345	273,131	714,522		5,957,068	158,241	1,482,013	12,036,383
1984	4,525,029	2,194,904	996,483	1,412,822	544,082	10,197,349	11,587	1,245,042	21,127,298
1985	6,715,143	1,002,872	523,773	527,132	58,183	10,843,752	1,448,809	2,733,562	23,853,226
1986	2,488,540	944,871	214,593	285,184	43,061	6,374,535		147,268	10,498,052
1987	6,964,549	2,419,611	1,578,568	750,877	89,902	13,341,940	111,011	955,988	26,212,446
1988	481,324	286,743	2,932,072	7,738	529,329	5,411,424		1,776	9,650,406
1989	3,151,096	6,464,090	3,925,487	181,565			^a	73,177	13,795,415
1990	7,970,364	5,482,585	2,692,788	891,444	534,951	17,811,479	10,658	12,325	35,406,594
1991	2,617,222	4,150,612	2,211,575		64,591	17,849,425			26,893,425
1992	489,228	1,142,061	363,887		543,115	3,039,775			5,578,066
1993		413,308	493,747		130,542	2,475,798			3,513,395
1994	11,554,320	7,171,038	3,597,094		565,669	3,408,093			26,296,214
1995	4,235,638	3,656,119	1,078,693		88,830	1,707,745	18,239	11,418	10,796,682
1996 ^b	6,059,063	5,039,988	1,543,869		35,691	5,046,919			17,725,530
1997 ^c	4,534,365	3,162,822	2,030,586		222,934	5,929,544	65,107	28,040	15,973,398
1998 ^c	2,231,061	5,035,736	3,228,761		134,984	8,425,853	430,525	350,081	19,837,001
1999	12,305,629	4,981,085	3,542,130		170,525	9,511,998	189,641	914,907	31,615,915
2000	9,819,466	4,093,620	3,359,542	17,223	514,258	9,308,399	87,634	549,763	27,749,905
10 year Average (1990-99)	5,777,432	4,023,535	2,078,313	891,444	249,183	7,520,663	142,834	263,354	19,363,622

^a These districts were closed due to the Exxon Valdez oil spill.

^b Eastern and Northern District totals include discarded salmon.

^c Montague District totals include discarded salmon.

Appendix E.4. Aerial escapement indices for pink and chum salmon by district,
Prince William Sound, 1999.

PINK SALMON (ODD CYCLE)							
District	Escapement Goal	Desired Escapement Range			1977-97 Mean Index	Observed Escapement Index ^a	Deviation From Goal
Eastern	422,000	380,000	-	465,000	485,861	622,502	47.5%
Northern/Unakwik	128,000	115,000	-	141,000	131,552	214,723	67.8%
Coghill	178,000	160,000	-	196,000	131,960	168,816	-5.2%
Northwestern	83,000	75,000	-	92,000	97,261	52,340	-36.9%
Eshamy	5,700	5,100	-	6,200	5,602	6,900	21.1%
Southwestern	116,000	105,000	-	128,000	151,801	163,347	40.8%
Montague	162,000	146,000	-	179,000	236,301	381,054	135.2%
Southeastern	333,000	300,000	-	366,000	482,167	853,180	156.2%
Total	1,427,700					2,462,862	72.5%

CHUM SALMON							
District	Escapement Goal	Desired Escapement Range			1976-98 Mean Index	Observed Escapement Index ^a	Deviation From Goal
Eastern	98,100	87,200	-	109,000	90,277	242,713	147.4%
Northern/Unakwik	33,075	29,400	-	36,750	38,691	36,886	11.5%
Coghill	33,325	29,600	-	37,050	20,903	5,057	-84.8%
Northwestern	21,350	19,000	-	23,700	14,758	4,544	-78.7%
Eshamy	0	0	-	0	33		
Southwestern	3,825	3,400	-	4,250	1,880	2,393	-37.4%
Montague	12,825	11,400	-	14,250	1,074	8,725	-32.0%
Southeastern	22,500	20,000	-	25,000	18,694	36,181	60.8%
Total	225,000					336,499	49.6%

^a Based on weekly aerial survey counts of 208 index spawning streams in Prince William Sound. This does not represent the total spawning escapement but rather a comparable annual index.

Appendix E.5. Pink salmon harvests and escapement indices, including hatchery sales harvests and broodstock, Prince William Sound, 1970 - 1999. Historical data revised in 1989.

PINK SALMON ESCAPEMENTS ^a										Hatchery		Common Property Catch ^b	Total Run ^c
Year	Eastern	Northern/ Unakwik	Coghill	Northwest	Eshamy	Southwest	Montague	Southeastern	Total	Sales	Brood		
1970	387,090	125,360	95,170	82,660	7,610	66,790	73,880	140,660	979,220			2,809,996	3,789,216
71	352,800	126,210	62,160	14,320	1,710	79,140	296,730	179,480	1,112,550			7,310,964	8,423,514
72	344,470	83,900	30,960	39,020	1,100	29,530	33,140	79,060	641,180			54,783	695,963
73	309,040	69,660	493,780	2,910	0	52,320	119,520	177,780	1,225,010			2,056,878	3,281,888
74	256,880	206,750	56,940	163,930	6,240	160,980	11,750	94,650	958,120			448,773	1,406,893
1975	412,560	38,260	452,430	4,990	0	77,270	85,380	194,670	1,265,560			4,452,805	5,718,365
76	472,080	139,600	57,090	68,150	5,840	52,120	13,790	117,590	926,260			3,018,995	3,945,255
77	390,930	69,980	130,510	80,890	16,450	178,670	152,960	277,780	1,298,170	7,745	16,112	4,514,431	5,844,258
78	279,120	163,010	85,450	132,300	5,430	258,980	56,690	164,030	1,145,010	114,188	40,432	2,780,073	4,079,703
79	642,220	200,730	70,980	124,020	0	231,300	219,400	728,630	2,217,280	223,748	54,207	15,393,223	17,888,458
1980	535,960	189,140	214,930	159,260	13,100	133,470	118,400	307,680	1,671,940	346,728	145,061	13,434,024	15,597,753
81	599,340	243,170	106,450	51,210	3,990	93,630	255,420	359,870	1,713,080	707,037	268,501	19,286,542	21,975,160
82	573,070	332,560	368,380	174,290	15,080	195,950	132,380	482,860	2,274,570	1,354,732	239,945	18,858,647	22,727,894
83	481,950	168,410	310,330	196,630	12,610	161,290	230,200	601,680	2,163,100	686,963	258,062	13,309,461	16,347,586
84	1,209,740	593,310	429,450	452,370	16,860	345,760	191,810	792,560	4,031,860	415,393	341,259	21,683,076	26,471,588
1985	750,530	214,210	296,970	199,190	1,410	181,270	332,240	645,510	2,621,330	1,209,960	640,340	23,959,698	28,431,328
86	356,380	141,420	101,600	81,490	3,840	74,980	44,680	155,830	960,220	905,464	466,471	10,498,052	12,830,207
87	514,570	132,960	147,060	75,390	3,450	112,920	149,260	330,630	1,466,240	2,691,190	1,158,908	26,125,769	31,442,107
88	362,370	143,850	37,070	73,780	490	126,440	67,990	152,540	964,530	1,632,701	824,302	9,650,406	13,071,939
89	359,730	106,530	45,510	68,540	19,470	176,230	181,760	315,000	1,272,770	5,737,911	856,927	13,854,209	23,796,279
1990	443,660	131,580	49,110	115,870	17,870	150,100	113,572	304,090	1,325,852	6,691,160	749,910	35,430,821	46,239,241
91	474,380	165,930	98,580	101,320	18,800	197,095	247,890	533,170	1,837,165	5,201,860	1,324,255	31,178,750	40,295,731
92	204,383	72,915	23,611	42,308	2,709	66,953	47,156	95,070	555,105	2,626,248	802,117	5,578,099	9,984,715
93	315,209	95,614	41,837	46,011	9,348	98,573	144,784	315,093	1,066,469	2,212,403	893,462	3,548,694	7,721,028
94	615,240	178,151	65,648	141,290	11,799	144,594	60,084	196,378	1,413,184	10,521,439	1,467,755	26,364,862	39,767,240
1995	396,696	84,447	46,029	50,582	10,182	82,490	183,448	336,310	1,190,184	5,090,152	1,154,635	10,975,079	18,410,050
96	584,236	218,022	104,781	86,709	3,000	63,337	92,966	330,285	1,483,336	8,291,205	1,264,701	17,745,365	28,784,607
97	345,725	65,260	52,961	53,740	914	112,010	206,943	585,135	1,422,688	9,854,675	1,048,485	15,973,403	28,299,251
98	377,700	213,288	85,968	97,485	4,644	280,335	161,275	199,410	1,420,105	8,825,226	933,503	19,836,055	31,014,889
99	622,502	214,723	168,816	52,340	6,900	163,347	381,054	853,180	2,462,862	13,130,211	1,511,755	31,615,915	48,720,743
EVEN CYCLE AVG. (1966-96)													
Avg.	465,429	198,393	120,566	124,018	8,124	143,451	77,302	235,081	1,372,363	3,793,135	661,405	11,373,154	15,772,845
ODD CYCLE AVG. (1965-97)													
Avg.	412,904	122,362	150,084	78,563	6,629	117,672	170,267	358,834	1,417,317	3,056,695	697,627	11,873,841	15,883,128

^aCoghill and Northwestern escapement figures correspond to current district boundaries.

^bIncludes the common property harvest of both wild and hatchery stocks. Does not include hatchery sales harvests.

^cRepresents the sum of the commercial catch, hatchery sales, brood (including roe recoveries), plus the escapement index. Does not account for wild stock escapement into non-index streams.

Appendix E.6. Weekly aerial estimates of pink salmon escapement by statistical area, Prince William Sound, 1999.

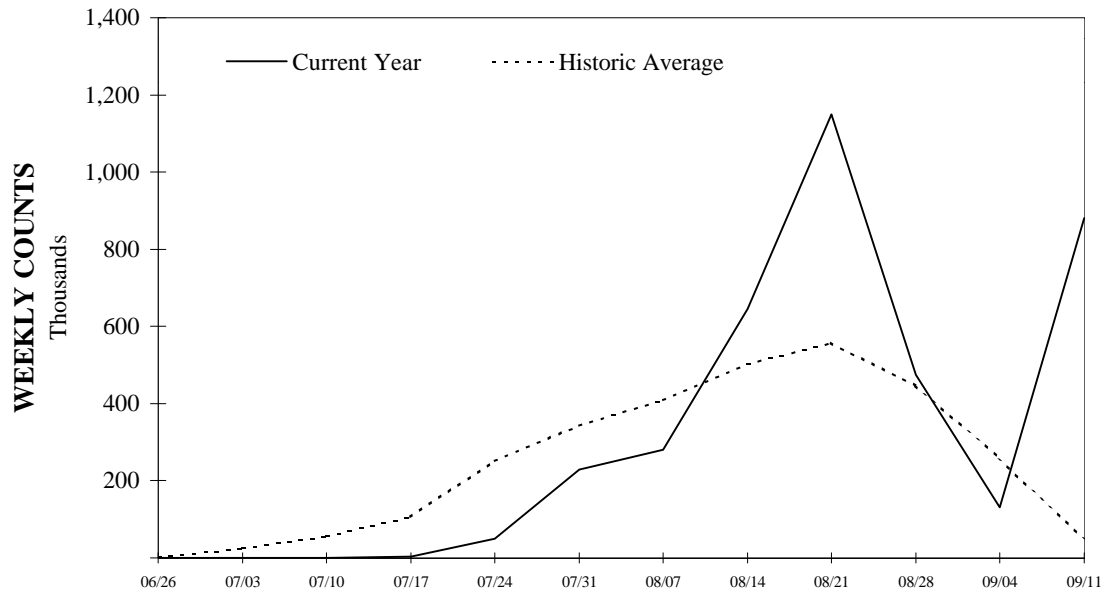
Survey Location		Week Ending Dates ^a											Adjusted Total ^b	
		06/26	07/03	07/10	07/17	07/24	07/31	08/07	08/14	08/21	08/28	09/04		09/11
Orca Inlet	22110	0	NS	0	0	500	1,650	8,500	13,000	25,500	NS	NS	10,000	36,789
Simpson & Sheep Bay	22120	NS	NS	0	40	650	7,000	20,400	46,100	66,100	NS	NS	65,500	141,498
Port Gravina	22130	0	0	0	100	900	6,110	25,200	54,800	100,400	NS	NS	120,400	214,990
Port Fidalgo	22140	0	100	0	1,060	6,750	6,910	25,950	12,410	55,300	NS	NS	76,200	139,777
Valdez Arm	22150	1	0	0	310	750	2,940	5,020	13,710	26,500	NS	NS	59,000	87,451
Port Valdez	22161	0	0	0	0	10	30	350	400	1,900	NS	NS	350	1,997
Eastern District Total		1	100	0	1,510	9,560	24,640	85,420	140,420	275,700	NS	NS	331,450	622,502
Columbia & Long Bay	22210	0	0	0	0	200	20	200	400	3,600	11,620	NS	44,000	47,397
Wells Bay & Unakwik Inlet	22220	0	0	0	0	300	3,720	12,450	25,600	27,903	36,400	NS	92,900	133,037
Eaglek Bay	22230	NS	NS	NS	NS	0	1,300	2,750	7,250	5,450	19,150	NS	9,700	27,289
Northern District Total		0	0	0	0	500	5,040	15,400	33,250	36,953	67,170	NS	146,600	207,723
Upper Unakwik Inlet	22910	NS	NS	NS	NS	0	0	0	0	20	500	NS	7,000	7,000
Unakwik District (229) Total		NS	NS	NS	NS	0	0	0	0	20	500	NS	7,000	7,000
West Side Port Wells	22310	NS	NS	NS	NS	0	1,100	7,050	11,722	14,050	15,800	NS	6,060	26,518
Esther Passage	22320	NS	NS	NS	NS	0	0	0	0	100	250	NS	750	791
College Fiord	22330	NS	NS	NS	NS	2,000	101,000	12,000	50,000	60,000	36,000	NS	25,020	141,507
Coghill District Total		NS	NS	NS	NS	2,000	102,100	19,050	61,722	74,150	52,050	NS	31,830	168,816
Passage Canal & Cochrane	22410	NS	NS	NS	NS	0	60	55	3,050	1,700	8,960	NS	9,110	14,811
Culross Passage	22430	NS	NS	NS	NS	0	200	2,600	2,150	NS	5,100	NS	9,100	13,179
Port Nellie Juan	22440	NS	NS	NS	NS	0	500	2,470	14,900	NS	11,200	NS	9,550	24,350
Northwestern District Total		NS	NS	NS	NS	0	760	5,125	20,100	1,700	25,260	NS	27,760	52,340
Crafton/Eshamy	22530	NS	NS	NS	NS	0	0	0	50	NS	700	2,400	5,050	6,900
Eshamy District Total		NS	NS	NS	NS	0	0	0	50	NS	700	2,400	5,050	6,900
Chenega Is. & Dangerous Passage	22620	NS	NS	NS	NS	NS	430	2,970	19,350	46,650	37,600	87,200	NS	100,990
East Knight Is.	22630	NS	NS	NS	NS	NS	0	100	500	3,000	20,000	8,000	NS	20,000
Bainbridge & Latouche Passage	22640	NS	NS	NS	NS	NS	0	210	350	3,000	6,500	8,400	NS	9,500
Port Bainbridge	22650	NS	NS	NS	NS	NS	0	1,000	15,000	20,000	15,000	25,000	NS	32,857
Southwestern District Total		NS	NS	NS	NS	NS	430	4,280	35,200	72,650	79,100	128,600	NS	163,347
Montague Strait	22710	NS	NS	0	150	NS	650	29,510	113,100	225,300	189,800	NS	NS	302,235
Green Island	22720	NS	NS	0	0	NS	10	2,270	17,220	50,000	59,900	NS	NS	78,819
Montague District Total		NS	NS	0	150	NS	660	31,780	130,320	275,300	249,700	NS	NS	381,054
Orca Is. & East Hawkins	22810	NS	NS	0	0	0	0	3,000	0	800	NS	NS	1,500	3,000
Hawkins Cutoff	22820	NS	NS	0	0	6,050	50,000	64,250	97,200	167,500	NS	NS	53,200	262,132
North Hawkins & Canoe Passage	22830	NS	NS	0	0	0	2,400	7,520	20,350	61,200	NS	NS	46,500	104,767
Double Bay	22840	NS	NS	0	10	0	156	3,700	16,600	49,500	NS	NS	44,000	95,287
Johnstone Point	22850	NS	NS	0	125	52	4,100	2,700	12,500	31,500	NS	NS	31,400	65,040
Port Etches	22860	10	NS	100	1,000	31,700	39,054	38,150	77,300	101,800	NS	NS	154,000	322,954
Southeastern District Total		10	NS	100	1,135	37,802	95,710	119,320	223,950	412,300	NS	NS	330,600	853,180
TOTAL OF 9 DISTRICTS		11	100	100	2,795	49,862	229,340	280,375	645,012	1,148,773	474,480	131,000	880,290	2,462,862

^aThere are a total of 209 streams included in the systematic aerial survey program. The survey program commences in the Eastern District where the earliest escapements in the Sound occur. Weather and conditions permitting, each stream is flown weekly. Failure to fly a survey due to run timing or bad survey conditions is denoted by NS (no survey). A notation of NC (no count) occurs when a stream is flown but no count is possible because of survey conditions (ie. water clarity). During the peak of the pink salmon run many streams are flown twice weekly to provide fisheries managers with more timely escapement data. In cases where more than one survey per week was flown the weekly observation shown in this table is the average of the two counts if observing conditions during both were good or, the maximum of the two counts if conditions during the minimum count were poor.

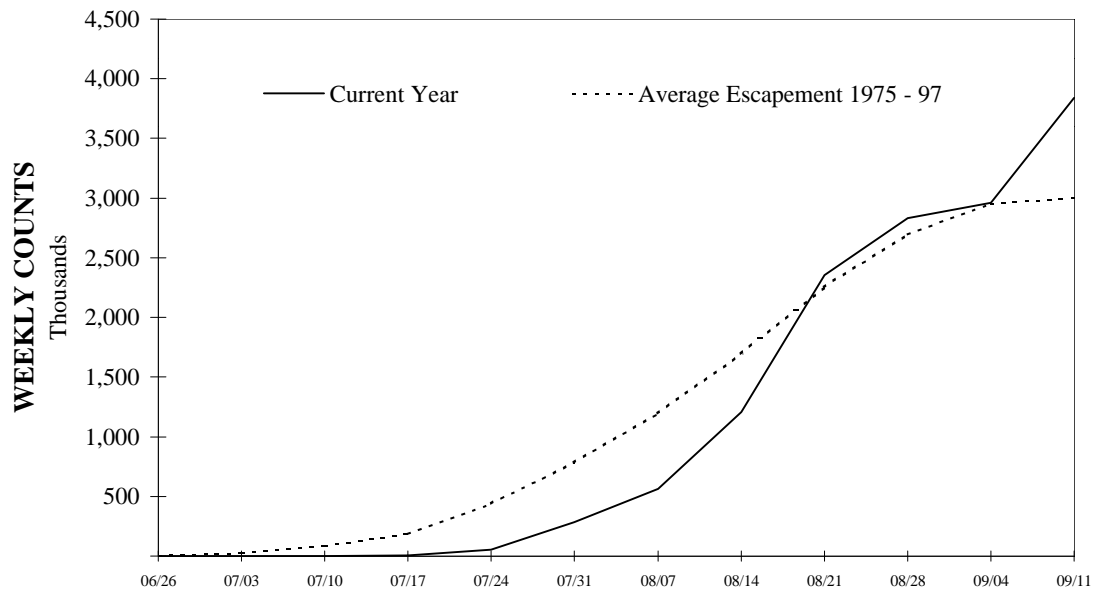
^bThe adjusted total is an escapement estimate based a geometric method used since the inception of the systematic survey program in the early 1960's. In this method, aerial observers are assumed to count without error or bias. Linear interpolations between observations are used to estimate numbers of fish in the stream on days when no surveys are flown. All daily observations and interpolations are summed across the season. Because fish seen on day $ii+1$ may include fish seen on day ii , the sum of all daily observations and interpolations must be divided by some residence time for fish in the streams to account for duplicate observations. The residence time of 17.5 days which has historically been used in this calculation is from tagging data completed by National Marine Fisheries Service on Olsen Creek in the early 1960's. Since observer bias does occur and since both observer bias and stream life are stream specific, adjusted totals in this table may be used for interannual comparisons but should not be interpreted as the true escapement.

PWS PINK STREAM COUNTS - ALL DISTRICTS

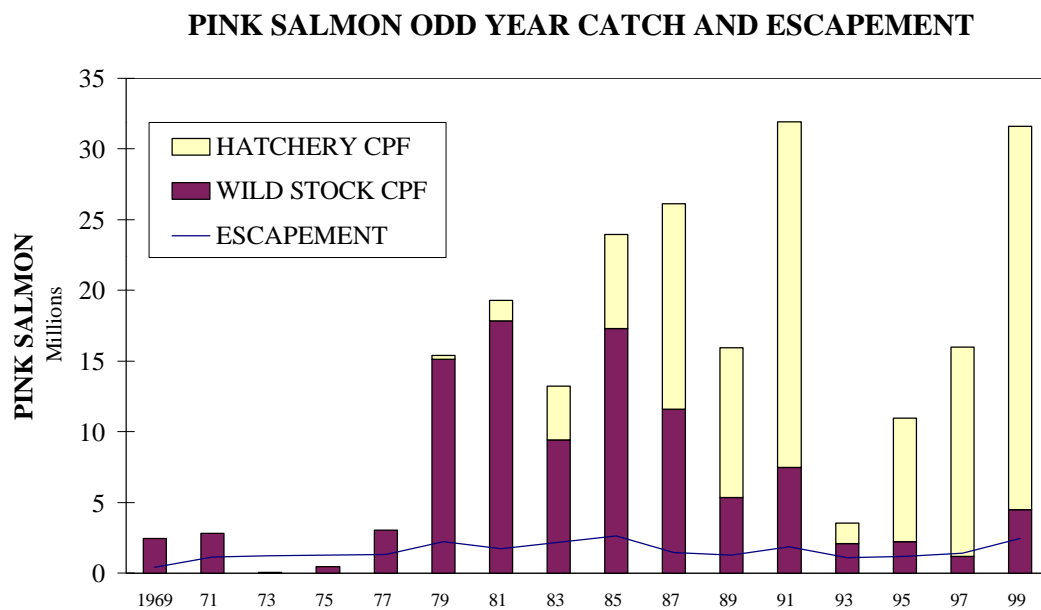
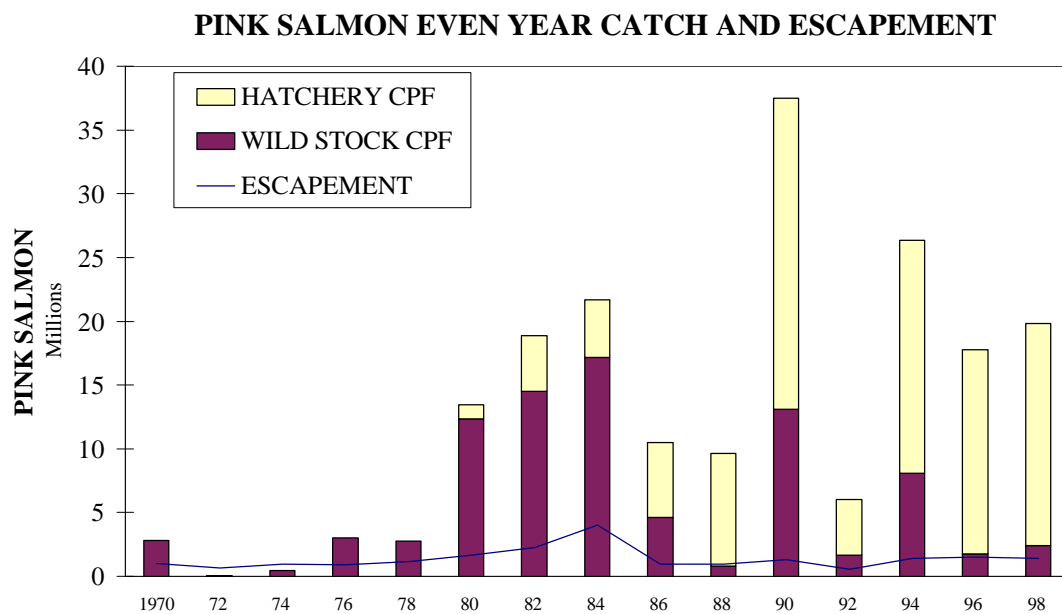
CURRENT YEAR VS. 1975 - 1997 ODD YEAR AVERAGE



CUMULATIVE



Appendix E.7. Current year and historic weekly pink salmon escapement performance of index spawning streams, Prince William Sound, 1999.



Appendix E.8. Pink salmon catch and escapement, even years (1970 - 98), and odd years (1969 - 99), Prince William Sound, Alaska.

Appendix E.9. Chum salmon harvests and escapement indices, including hatchery sales harvests and broodstock,
Prince William Sound, 1970 - 1999.

CHUM SALMON ESCAPEMENTS ^a										Hatchery		Common Property Catch ^b	Total Run ^c
Year	Eastern	Northern	Coghill	Northwestern	Eshamy	Southwestern	Montague	Southeastern	Total	Sales	Brood		
1970	34,430	4,020	11,880	2,720	0	550	0	7,950	61,550			230,661	292,211
71	49,730	11,870	6,600	5,600	100	1,430	27,990	6,450	109,770			574,265	684,035
72	112,950	70,760	28,160	22,980	0	4,010	3,340	26,990	269,190			45,370	314,560
73	213,170	140,030	72,610	13,250	0	1,020	3,110	48,080	491,270			729,839	1,221,109
74	72,010	55,510	29,280	6,580	0	240	80	3,200	166,900			88,544	255,444
1975	30,040	8,910	3,640	430	0	1,280	140	2,850	47,290			100,479	147,769
76	16,260	29,430	25,670	8,300	0	90	0	770	80,520			370,478	450,998
77	47,880	48,600	43,940	10,090	0	700	0	8,280	159,490			575,839	735,329
78	90,250	27,480	18,160	12,940	0	790	0	6,550	156,170			485,147	641,317
79	42,630	17,320	6,330	8,770	0	90	0	5,140	80,280			324,040	404,320
1980	26,720	27,880	23,340	3,060	0	2,040	70	6,710	89,820	6		412,948	502,774
81	71,560	28,670	2,050	15,130	0	710	0	16,010	134,130	118		1,745,869	1,880,117
82	146,120	68,580	22,130	21,880	0	1,530	0	25,260	285,500	0	86,200	1,335,368	1,707,068
83	143,800	85,720	61,410	31,660	340	3,170	0	21,410	347,510	0	44,000	1,030,546	1,422,056
84	129,190	59,080	19,690	7,920	0	20	0	8,650	224,550	4,886	3,000	1,196,785	1,429,221
1985	111,310	33,410	22,140	13,290	0	620	0	4,470	185,240	3,840	0	1,302,090	1,491,170
86	126,690	50,740	13,140	17,420	0	1,890	0	8,830	218,710	20,683	12,523	1,662,366	1,914,282
87	183,620	38,700	24,510	26,460	0	1,690	0	44,020	319,000	2,549	15,574	1,902,063	2,239,186
88	258,560	75,420	39,240	40,780	0	2,350	500	66,930	483,780	42,694	108,271	1,792,616	2,427,361
89	112,080	46,470	22,680	27,430	320	11,690	0	22,640	243,310	129,551	74,513	862,551	1,309,925
1990	115,100	112,480	26,020	37,020	0	80	1,050	7,275	299,025	24,554	107,284	935,284	1,366,147
91	86,360	19,080	6,070	8,960	0	2,800	925	9,203	133,398	13,471	114,814	318,435	580,118
92	48,804	12,903	10,003	11,072	300	2,940	783	3,881	90,686	57,392	183,940	271,176	603,194
93	54,102	24,975	8,430	18,966	0	1,300	30	19,172	126,975	475,148	140,330	706,196	1,448,649
94	40,476	23,942	14,176	12,992	100	2,225	0	4,057	97,968	380,365	114,654	677,848	1,270,835
1995	75,655	28,899	11,596	4,883	0	2,250	1,000	23,200	147,483	231,539	172,542	486,510	1,038,074
96	137,908	55,568	19,669	24,405	0	2,231	5,216	47,334	292,331	1,066,705	253,751	1,011,291	2,624,078
97	93,146	19,429	3,101	8,387	0	800	4,000	43,274	172,137	811,179	178,933	1,413,546	2,575,795
98	86,227	28,867	22,764	7,553	0	1,602	10,690	52,103	209,806	519,215	179,875	747,672	1,656,568
99	242,713	36,691	5,057	4,544	0	2,393	8,725	36,181	336,304	777,180	207,073	2,186,658	3,507,215
1965-98 AVG	90,702	39,760	19,835	13,496	34	1,851	2,815	18,429	186,921	199,152	110,960	732,401	1,083,266

^aCoghill and Northwestern escapement figures correspond to current district boundaries.

^bIncludes the common property harvest of both wild and hatchery stocks. Does not include hatchery sales harvests.

^cRepresents the sum of the common property catch, hatchery sales and brood, plus the escapement index. Does not account for wild stock escapement into non-index streams.

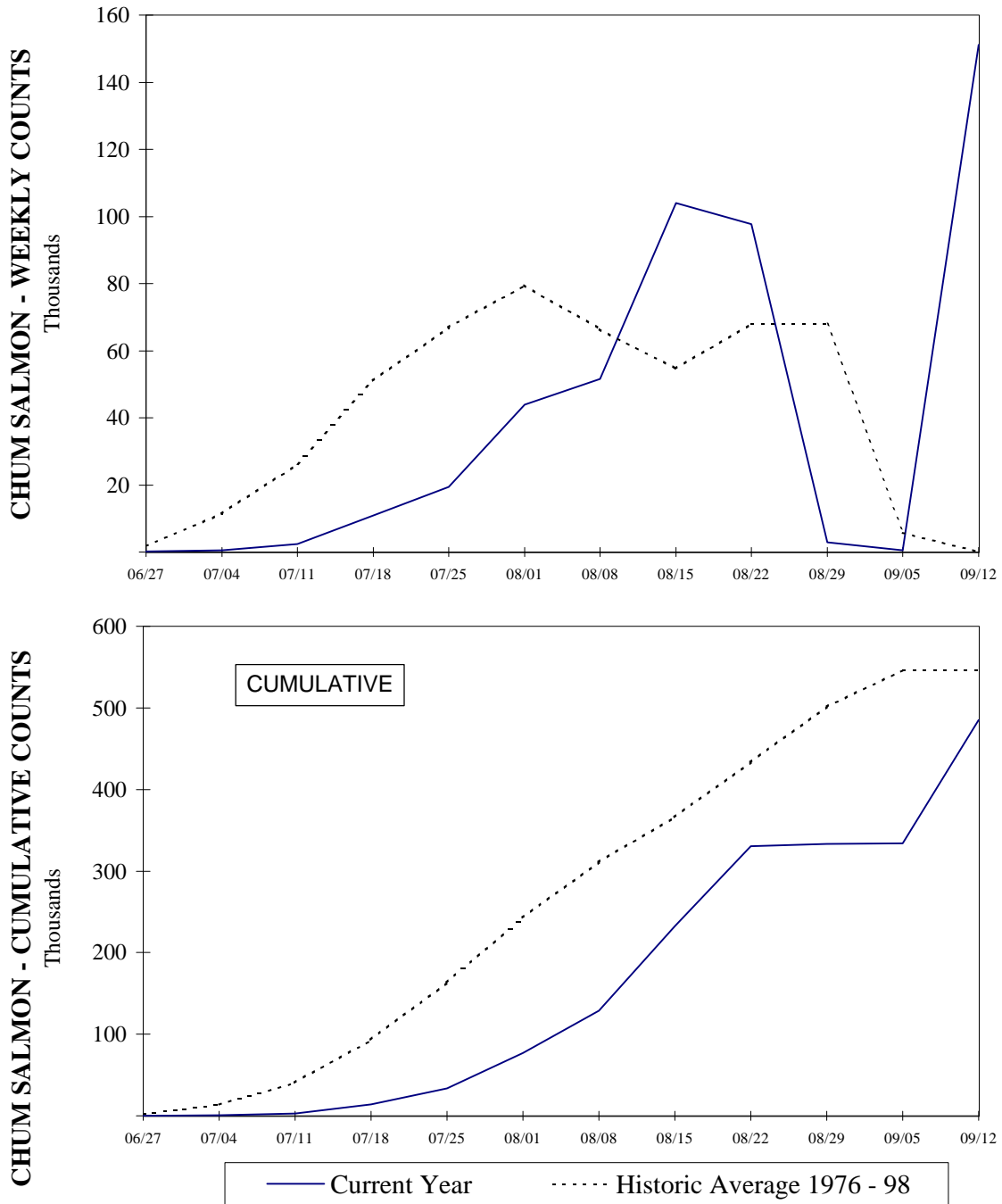
Appendix E.10. Weekly aerial estimates of chum salmon escapement by statistical area, Prince William Sound, 1999.

Survey Location		Week Ending Dates ^a												Adjusted Total ^b
		06/26	07/03	07/10	07/17	07/24	07/31	08/07	08/14	08/21	08/28	09/04	09/11	
Orca Inlet	22110	0	NS	20	200	400	2,500	3,600	4,000	2,000	NS	NS	150	5,926
Simpson & Sheep Bay	22120	NS	NS	100	270	610	1,800	700	13,000	3,500	NS	NS	10,200	26,199
Port Gravina	22130	137	400	1,050	3,310	2,150	5,250	16,400	42,300	25,000	NS	NS	15,000	67,285
Port Fidalgo	22140	0	10	200	1,100	1,850	5,300	4,400	22,600	24,000	NS	NS	40,200	75,434
Valdez Arm	22150	11	30	160	811	600	1,810	2,350	5,800	8,450	NS	NS	55,500	67,669
Port Valdez	22161	0	0	0	0	0	0	0	200	0	NS	NS	0	20
Eastern District Total		148	440	1,530	5,691	5,610	16,660	27,450	87,900	62,950	NS	NS	121,050	242,713
Columbia & Long Bay	22210	0	20	150	1,800	2,500	2,110	1,700	1,600	2,300	10	NS	9,500	13,407
Wells Bay & Unakwik Inlet	22220	57	60	500	2,010	6,636	9,785	6,570	1,512	3,362	75	NS	10,000	21,577
Eaglek Bay	22230	NS	NS	NS	NS	252	1,650	425	100	50	0	NS	0	1,902
Northern District Total		57	80	650	3,810	9,388	13,545	8,695	3,212	5,712	85	NS	19,500	36,886
Upper Unakwik Inlet	22910	NS	NS	NS	NS	0	0	0	0	0	0	NS	0	0
Unakwik District (229) Total		NS	NS	NS	NS	0	0	0	0	0	0	NS	0	0
West Side Port Wells	22310	NS	NS	NS	NS	25	521	420	590	470	100	NS	0	1,003
Esther Passage	22320	NS	NS	NS	NS	2	50	50	20	0	0	NS	0	54
College Fjord	22330	NS	NS	NS	NS	50	1,000	1,200	2,500	4,000	500	NS	0	4,000
Coghill District Total		NS	NS	NS	NS	77	1,571	1,670	3,110	4,470	600	NS	0	5,057
Passage Canal & Cochrane	22410	NS	NS	NS	NS	630	500	174	300	200	100	NS	300	1,418
Culross Passage	22430	NS	NS	NS	NS	6	0	0	0	NS	0	NS	0	6
Port Nellie Juan	22440	NS	NS	NS	NS	525	2,826	700	400	NS	0	NS	0	3,120
Northwestern District Total		NS	NS	NS	NS	1,161	3,326	874	700	200	100	NS	300	4,544
Crafton/Eshamy	22530	NS	NS	NS	NS	0	0	0	0	NS	0	0	0	0
Eshamy District Total		NS	NS	NS	NS	0	0	0	0	NS	0	0	0	0
Chenega Is. & Dangerous Passage	22620	NS	NS	NS	NS	NS	20	1,210	200	1,000	950	500	NS	2,183
East Knight Is.	22630	NS	NS	NS	NS	NS	0	0	0	0	0	0	NS	0
Bainbridge & Latouche Passage	22640	NS	NS	NS	NS	NS	10	100	0	0	0	0	NS	110
Port Bainbridge	22650	NS	NS	NS	NS	NS	0	100	0	0	0	0	NS	100
Southwestern District Total		NS	NS	NS	NS	NS	30	1,410	200	1,000	950	500	NS	2,393
Montague Strait	22710	NS	NS	0	0	NS	0	2,300	100	2,200	0	NS	NS	4,500
Green Island	22720	NS	NS	0	86	NS	176	1,501	2,150	3,600	1,200	NS	NS	4,225
Montague District Total		NS	NS	0	86	NS	176	3,801	2,250	5,800	1,200	NS	NS	8,725
Orca Is. & East Hawkins	22810	NS	NS	0	0	0	0	0	0	0	NS	NS	0	0
Hawkins Cutoff	22820	NS	NS	0	3	4	0	30	0	0	NS	NS	0	37
North Hawkins & Canoe Passage	22830	NS	NS	0	0	0	6	0	0	0	NS	NS	0	6
Double Bay	22840	NS	NS	0	8	225	500	70	0	550	NS	NS	0	800
Johnstone Point	22850	NS	NS	0	20	200	400	0	0	0	NS	NS	0	400
Port Etches	22860	5	NS	200	1,250	2,700	7,654	7,510	6,560	17,000	NS	NS	10,300	34,938
Southeastern District Total		5	NS	200	1,281	3,129	8,560	7,610	6,560	17,550	NS	NS	10,300	36,181
TOTAL OF 9 DISTRICTS		210	520	2,380	10,868	19,365	43,868	51,510	103,932	97,682	2,935	500	151,150	336,499

^aThere are a total of 209 streams included in the systematic aerial survey program. The survey program commences in the Eastern District where the earliest escapements in the Sound occur. Weather and conditions permitting, each stream is flown weekly. Failure to fly a survey due to run timing or bad survey conditions is denoted by NS (no survey). A notation of NC (no count) occurs when a stream is flown but no count is possible because of survey conditions (ie. water clarity). During the peak of the pink salmon run many streams are flown twice weekly to provide fisheries managers with more timely escapement data. In cases where more than one survey per week was flown the weekly observation shown in this table is the average of the two counts if observing conditions during both were good or, the maximum of the two counts if conditions during the minimum count were poor.

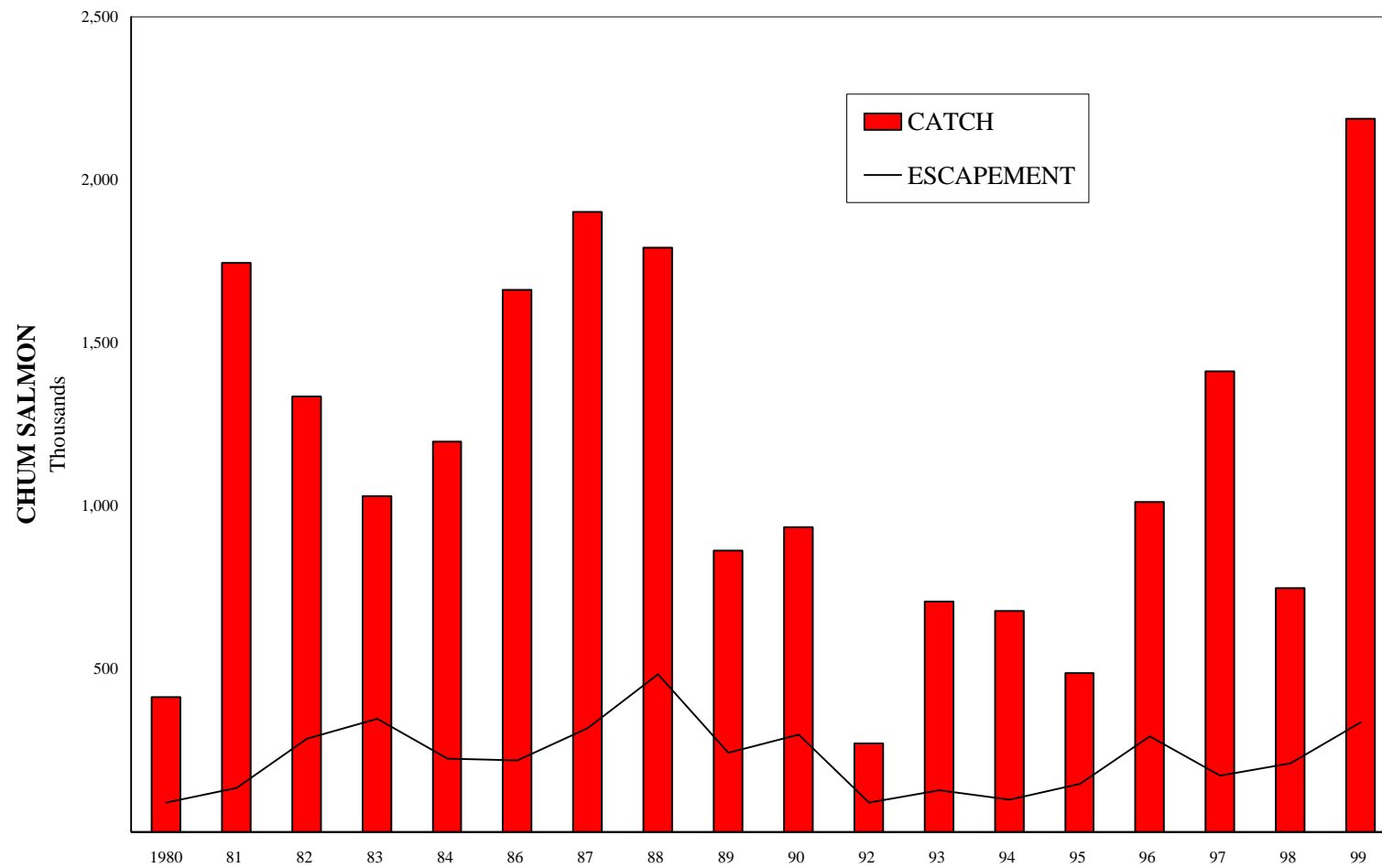
^bThe adjusted total is an escapement estimate based a geometric method used since the inception of the systematic survey program in the early 1960's. In this method, aerial observers are assumed to count without error or bias. Linear interpolations between observations are used to estimate numbers of fish in the stream on days when no surveys are flown. All daily observations and interpolations are summed across the season. Because fish seen on day $ii+1$ may include fish seen on day ii , the sum of all daily observations and interpolations must be divided by some residence time for fish in the streams to account for duplicate observations. The residence time of 17.5 days which has historically been used in this calculation is from tagging data completed by National Marine Fisheries Service on Olsen Creek in the early 1960's. Since observer bias does occur and since both observer bias and stream life are stream specific, adjusted totals in this table may be used for interannual comparisons but should not be interpreted as the true escapement.

PWS CHUM STREAM COUNTS - ALL DISTRICTS CURRENT YEAR VS. 1976 - 98 HISTORICAL AVERAGE



Appendix E.11. Current year and historical weekly chum salmon escapement performance from index spawning streams, Prince William Sound, 1999.

CHUM SALMON CATCH AND ESCAPEMENT



Appendix E.12. Chum salmon catch and escapement, Prince William Sound, 1980 - 1999.

Appendix E.13. Sockeye salmon escapement counts from selected systems, Prince William Sound, 1999.

Stream Name ^a	Stream Number	Weekly Count (week ending dates)									
		07/10	07/17	07/24	07/31	08/07	08/14	08/21	08/28	09/04	09/11
Billy's Hole	218	30	500	1,500	1,800	2,000	2,100	600	220	NS	0
Swanson Creek	432	NS	NS	0	0	1	0	0	0	NS	0
Red Creek	300	NS	NS	0	700	125	125	0	2	NS	2
Coghill River	322	NS	NS	2,000	200	0	0	500	0	NS	50
Halferty Creek	454	NS	NS	0	0	20	0	0	10	NS	20
Cochrane Creek	461	NS	NS	0	0	0	0	NS	0	NS	10
Shrode Creek	476	NS	NS	1,800	925	1,300	900	NS	900	NS	65
Gumboot Creek	507	NS	NS	500	0	0	0	NS	0	0	0
Eshamy River	511	NS	NS	0	0	200	0	NS	0	100	0
Jackpot River	608	NS	NS	NS	0	350	500	150	500	500	NS
Bainbridge Creek	630	NS	NS	NS	0	50	60	1,000	0	0	NS
Miner's River	244	NS	NS	0	450	600	700	850	350	NS	200

^aCounts contained in this table are obtained in conjunction with the regular pink and chum aerial survey program. Many of these sockeye systems are difficult to survey by air, thus the counts do not necessarily represent total live abundance at a particular time.

		Brood Year and Age Class					
		1996	1995	1994	1993	1992	
		0.2	0.3	0.4	0.5	0.6	Total
Coghill District							
Strata Combined:	06/14 - 09/14						
Sampling dates:	06/16 - 07/17						
Sample size:	2,705						
Female	Percentage of sample	11.5	41.5	6.8	0.5	0.1	60.4
	Number in catch	150,830	543,249	89,631	7,072	827	791,609
Male	Percentage of sample	7.2	26.8	5.3	0.2	0.0	39.6
	Number in catch	93,711	351,873	69,598	3,163	297	518,642
Total	Percentage of sample	18.7	68.3	12.1	0.8	0.1	100.0
	Number in catch	244,849	895,122	159,229	10,236	1,123	1,310,559
	Standard error	11,535	13,536	9,258	2,125	878	
Montague District							
Strata Combined:	06/05 - 08/06						
Sampling dates:	06/09 - 06/30						
Sample size:	480						
Female	Percentage of sample	7.5	36.9	6.7	0.1	0.0	51.2
	Number in catch	47,683	235,827	42,982	680	0	327,172
Male	Percentage of sample	8.7	33.6	6.3	0.1	0.0	48.8
	Number in catch	55,519	214,916	40,419	906	0	311,760
Total	Percentage of sample	16.2	70.5	13.1	0.2	0.0	100.0
	Number in catch	103,201	450,743	83,401	1,586	0	638,932
	Standard error	14,890	17,562	12,009	586	0	
All Districts Combined							
Strata Combined:	06/05 - 09/14						
Sampling dates:	06/09 - 07/17						
Sample size:	3,185						
Female	Percentage of sample	10.2	40.0	6.8	0.4	0.0	57.4
	Number in catch	198,513	779,076	132,613	7,752	827	1,118,781
Male	Percentage of sample	7.7	29.1	5.6	0.2	0.0	42.6
	Number in catch	149,229	566,789	110,018	4,070	297	830,403
Total	Percentage of sample	17.9	69.0	12.4	0.6	0.1	100.0
	Number in catch	348,050	1,345,866	242,630	11,821	1,123	1,949,491
	Standard error	18,835	22,173	15,163	2,205	878	

Appendix E.15. Summary of periods, dates, hours open, and emergency orders issued by district,
for the commercial purse seine salmon fishery, Prince William Sound, 1999.
See Appendix C.11. for Unakwik District openings.

Eastern (221)		Northern (222)		Coghill (223)		Southwestern (226)		Montague (227)		Southeastern (228)		Emergency Orders Issued
Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	
								06/02-06/04	60 ^a			2-F-E-11-99
								06/05-06/08	84 ^a			2-F-E-11-99
								06/09-06/11	60 ^a			2-F-E-11-99
								06/12-06/15	84 ^a			2-F-E-11-99
								06/16-06/18	60 ^a			2-F-E-11-99
								06/19-06/22	84 ^a			2-F-E-11-99
								06/23-06/25	60 ^a			2-F-E-11-99
								06/26-06/29	84 ^a			2-F-E-11-99
								06/30-07/02	60 ^a			2-F-E-11-99
								07/03-07/06	84 ^a			2-F-E-11-99
07/06-07/06	12 ^a							07/07-07/09	60 ^a			2-F-E-22-99,2-F-E-24-99
												2-F-E-22-99
07/10-07/10	12 ^b			07/10-07/10	6 ^a							2-F-E-28-99,2-F-E-33-99
07/12-07/12	12 ^c			07/12-07/12	6 ^a							2-F-E-29-99,2-F-E-35-99
								07/10-07/13	84 ^a			2-F-E-22-99
07/14-07/14	12 ^b			07/14-07/14	6 ^a			07/14-07/16	60 ^b			2-F-E-38-99,2-F-E-43-99
												2-F-E-40-99
07/16-07/16	12 ^d			07/16-07/16	6 ^a					07/16-07/16	12 ^a	2-F-E-41-99
07/18-07/18	12 ^e			07/18-07/18	6 ^a					07/18-07/18	12 ^a	2-F-E-45-99
07/20-07/20	12 ^f			07/20-07/20	6 ^a	07/20-07/20	6 ^a	07/20-07/20	12 ^b	07/20-07/20	12 ^a	2-F-E-47-99
07/22-07/22	12 ^b			07/22-07/22	12 ^b	07/22-07/22	6 ^a	07/22-07/22	12 ^b	07/22-07/22	12 ^a	2-F-E-49-99
07/25-07/25	12 ^b	07/25-07/25	12 ^a	07/25-07/25	12 ^c	07/25-07/25	12 ^a			07/25-07/25	12 ^a	2-F-E-51-99, 2-F-E-63-99
07/27-07/27	12 ^g	07/27-07/27	12 ^a	07/27-07/27	12 ^b	07/27-07/27	12 ^b			07/27-07/27	12 ^a	2-F-E-53-99
		07/29-07/29	12 ^a			07/29-07/29	12 ^b			07/29-07/29	12 ^a	2-F-E-54-99
07/29-07/30	36 ^h			07/29-07/30	36 ^d							2-F-E-54-99
		07/31-07/31	12 ^a	07/31-07/31	12 ^d			07/31-07/31	4 ^c	07/31-07/31	12 ^b	2-F-E-59-99
07/31-08/01	36 ⁱ											2-F-E-59-99
08/02-08/02	12 ^j	08/02-08/02	12 ^a	08/02-08/02	12 ^d	08/02-08/02	12 ^c			08/02-08/02	12 ^b	2-F-E-60-99
08/04-08/04	12 ^k	08/04-08/04	12 ^a			08/04-08/04	12 ^c	08/04-08/04	12 ^d	08/04-08/04	12 ^a	2-F-E-62-99
				08/04-08/05	36 ^d							2-F-E-62-99
08/06-08/06	12 ^k	08/06-08/06	12 ^a					08/06-08/06	12 ^d	08/06-08/06	12 ^a	2-F-E-67-99
				08/06-08/07	36 ^d							2-F-E-67-99
		08/08-08/08	12 ^b			08/08-08/08	12 ^c	08/08-08/08	12 ^d			2-F-E-68-99
08/08-08/09	36 ⁱ			08/08-08/09	36 ^d					08/08-08/09	36 ^a	2-F-E-68-99
08/10-08/10	12 ⁱ	08/10-08/10	12 ^c	08/10-08/10	12 ^d	08/10-08/10	12 ^d	08/10-08/10	12 ^d	08/10-08/10	12 ^a	2-F-E-69-99
08/12-08/12	12 ⁱ	08/12-08/12	12 ^d	08/12-08/12	12 ^d	08/12-08/12	12 ^e	08/12-08/12	12 ^d	08/12-08/12	12 ^a	2-F-E-70-99
08/14-08/14	12 ^m	08/14-08/14	12 ^e	08/14-08/14	12 ^e	08/14-08/14	12 ^e	08/14-08/14	12 ^d	08/14-08/14	12 ^a	2-F-E-74-99
08/16-08/16	12 ^m	08/16-08/16	12 ^e	08/16-08/16	12 ^f	08/16-08/16	12 ^e	08/16-08/16	12 ^d	08/16-08/16	12 ^a	2-F-E-74-99, 2-F-E-75-99
08/18-08/18	12 ^m	08/18-08/18	12 ^e	08/18-08/18	12 ^f	08/18-08/18	12 ^e	08/18-08/18	12 ^d	08/18-08/18	12 ^a	2-F-E-74-99, 2-F-E-76-99
08/20-08/20	12 ^m	08/20-08/20	12 ^e	08/20-08/20	12 ^f	08/20-08/20	12 ^f	08/20-08/20	12 ^d	08/20-08/20	12 ^a	2-F-E-74-99, 2-F-E-77-99
08/22-08/22	12 ^m	08/22-08/22	12 ^e	08/22-08/22	12 ^f	08/22-08/22	12 ^g	08/22-08/22	12 ^d	08/22-08/22	12 ^a	2-F-E-74-99, 2-F-E-78-99
08/24-08/24	12 ^m	08/24-08/24	12 ^e	08/24-08/24	12 ^f	08/24-08/24	12 ^g	08/24-08/24	12 ^d	08/24-08/24	12 ^a	2-F-E-74-99, 2-F-E-79-99
08/25-08/27	60 ⁿ	08/25-08/27	60 ^e	08/25-08/27	60 ^f	08/25-08/27	60 ^h	08/25-08/27	60 ^d	08/25-08/27	60 ^a	2-F-E-79-99
08/28-08/28	4 ^o											2-F-E-84-99
08/28-08/31	84 ⁿ	08/28-08/31	84 ^e	08/28-08/31	84 ^g	08/28-08/31	84 ⁱ	08/28-08/31	84 ^d	08/28-08/31	84 ^a	2-F-E-79-99, 2-F-E-84-99
09/01-09/03	60 ⁿ	09/01-09/03	60 ^f	09/01-09/03	60 ^g	09/01-09/03	60 ⁱ	09/01-09/03	60 ^d	09/01-09/03	60 ^a	2-F-E-79-99, 2-F-E-85-99
09/04-09/07	84 ⁿ	09/04-09/07	84 ^g	09/04-09/07	84 ^g	09/04-09/07	84 ⁱ					2-F-E-79-99
09/08-09/10	60 ^p	09/08-09/10	60 ^h	09/08-09/10	60 ^g	09/08-09/10	60 ⁱ					2-F-E-85-99
		09/11-09/14	84 ⁱ	09/11-09/14	84 ^h	09/11-09/14	84 ^j					2-F-E-86-99
09/13-09/15	60 ^q											2-F-E-87-99
		09/15-09/17	60 ⁱ			09/15-09/17	60 ^j					2-F-E-86-99
09/16-09/17	36 ^r			09/16-09/17	36 ⁱ							2-F-E-86-99, 2-F-E-88-99, 2-F-E-95-99

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Eastern (221)		Northern (222)		Coghill (223)		Southwestern (226)		Montague (227)		Southeastern (228)		Emergency Orders Issued
Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	Dates	Hours Open	
		09/18-09/21	84 ⁺	09/20-09/21	36 ⁺	09/18-09/21	84 ^J					2-F-E-86-99 2-F-E-95-99 2-F-E-86-99 2-F-E-95-99 2-F-E-91-99 2-F-E-95-99, 2-F-E-98-99
		09/22-09/24	60 ⁺	09/23-09/24	36 ⁺	09/22-09/24	60 ^J					
		09/25-09/28	84 ⁺	09/27-09/28	36 ⁺	09/25-09/28	84 ^J					

Eastern District

Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters of Jack Bay, east of a line from Potato Point to the yellow Salmon Harvest Task Force (SHTF) marker at Tongue Point, and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed. All anadromous salmon stream closures remained in effect. Boundaries were amended at 12:00 noon as follows: the waters of Jack Bay east of a line from Entrance Point to the yellow SHTF marker at Tongue Point were closed. All other previously announced boundaries remained in effect.

Eastern District waters south of a line from Entrance Point to Potato Point were open. The waters of Jack Bay, east of a line from Entrance Point to the yellow SHTF marker at Tongue Point, and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed.

Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and the waters of Galena Bay east of the yellow SHTF markers in the narrows were closed.

Eastern District waters north of a line from Entrance Point to Potato Point and west of 146° 22.67' W. longitude were open. The waters of Jack Bay, east of the yellow SHTF at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows were closed. At 12:00 noon the Entrance Point to Potato Point boundary line was no longer in effect and waters of the Eastern District south of the Entrance Point - Potato Point line were open.

Eastern District waters north of a line from Entrance Point to Potato Point and west of 146° 22.67' W. longitude were open. The waters of Jack Bay, east of the yellow SHTF at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay east of the yellow SHTF markers in the narrows were closed. At 2:00 p.m. the Entrance Point to Potato Point boundary line was no longer in effect and waters of the Eastern District south of the Entrance Point - Potato Point line were open.

Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay, east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay, east of the yellow SHTF markers in the narrows, were closed.

Eastern District waters west of 146° 22.67' W. longitude were open.

Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' W. longitude were open for the entire period. At 8:00 a.m. Thursday, July 29, the Eastern District south of the Entrance Point to Potato Point line was open until 8:00 p.m. the same day. The waters of Jack Bay, east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay, east of the yellow SHTF markers in the narrows, were closed.

Eastern District waters inside a line from Entrance Point to Potato Point and west of 146° 30.62' W. longitude were open for the entire period. At 8:00 a.m. Saturday, July 31, the Eastern District south of the Entrance Point to Potato Point line was open until 8:00 p.m. the same day.

Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows, waters of Sawmill Bay west of the yellow SHTF markers at the entrance to the bay were closed.

Eastern District waters west of 146° 30.62' W. longitude were open. The waters of Jack Bay east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay; waters of Galena Bay east of the yellow SHTF markers in the narrows, waters of Sawmill Bay west of the yellow SHTF markers at the entrance to the bay were closed. Simpson Bay regulatory closed waters west of the longitude of Bomb Point were open.

Eastern District waters south of latitude of Middle Rock light were open. The waters of Jack Bay, east of the yellow SHTF marker at Tongue Point to the yellow SHTF marker on the northeast shore of Jack Bay and waters of Galena Bay, east of the yellow SHTF markers in the narrows and Sawmill Bay west of the yellow SHTF markers at the entrance to the bay, were closed.

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“ Eastern District waters south of latitude of Middle Rock light were open.
All regulatory waters and anadromous salmon stream closures remained in effect.

“ Eastern District waters south of a line from Entrance Point to Potato Point were open.
All regulatory waters and anadromous salmon stream closures remained in effect.

“ Within the Eastern District, only the Solomon Gulch Hatchery SHA was open.

“ Eastern District waters south of a line from Entrance Point to Potato Point and west of a line from the longitude of the grain elevators on the north shore of Port Valdez to the brown oil boom container van stationed on the shoreline between Solomon Gulch Hatchery and Allison were open. All waters of the of the Valdez small boat harbor and all waters within 50 yards of the entrance to the harbor were closed.
All regulatory waters and anadromous salmon stream closures remained in effect.

“ Eastern District waters west of a line from the longitude of the grain elevators on the north shore of Port Valdez to the brown oil boom container van stationed on the shoreline between Solomon Gulch Hatchery and Allison were open. All waters of the of the Valdez small boat harbor and all waters within 50 yards of the entrance to the harbor were closed. All regulatory waters and anadromous salmon stream closures remained in effect.

“ Eastern District waters north of latitude of Middle Rock light were open.
All regulatory waters and anadromous salmon stream closures remained in effect.

Northern District

“ Northern District waters east of the longitude of Unakwik Point were open. All anadromous salmon stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters south of the latitude of the southern most yellow SH1F marker in Siwash Bay located at approximately 60° 56.964' N. latitude were open. Waters inside of the yellow SH1F markers at the entrances to Granite Bay, Cedar Bay, and Wells Bay were closed.
All anadromous salmon stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters south of the latitude of the southern most yellow SH1F marker in Siwash Bay located at approximately 60° 56.964' N. latitude and waters of the Perry Island Subdistrict were open. Waters inside of the yellow SH1F markers at the entrances to Granite Bay, Cedar Bay, and Wells Bay were closed.
All anadromous salmon stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters inside of the yellow SH1F markers at the entrances to Granite Bay, Cedar Bay, Jonah Bay, Siwash Bay, and Wells Bay were closed. All anadromous salmon stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside the yellow SH1F markers at the entrances to Granite Bay, Cedar Bay, Siwash Bay, Jonah Bay, and Wells Bay were closed. All anadromous stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters of the Cannery Creek Hatchery THA and SHA and waters inside the yellow SH1F markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay were closed. All anadromous stream closures remained in effect. At 8:00 a.m., Thursday September 2, the Cannery Creek Hatchery THA and SHA were opened.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters inside the yellow SH1F markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay were closed. All anadromous stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point, and waters of the Perry Island Subdistrict were open. Waters inside the yellow SH1F markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek were closed.
All anadromous stream closures remained in effect.

“ Waters of the Northern District east of the longitude of the yellow SH1F marker near Pellew Point approximately 147° 40.271' W. longitude and waters west of the longitude of Granite Point were open. Waters of the Perry Island Subdistrict and inside the yellow SH1F markers at the entrances to Jonah Bay, Siwash Bay, Granite Bay, Cedar Bay, and Wells Bay and inside a line of buoys near the entrance to Cannery Creek were closed. All anadromous stream closures remained in effect.

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Coghill District

“ In the Coghill District, only the waters of the Wally Noerenberg Hatchery (WHN) Special Harvest Area (SHA) were open.

“ All waters of the Coghill District, including the WNH Terminal Harvest Area (THA) and SHA to a line of buoys in front of the hatchery barrier seine were open, except that Pigot, Hummer and Bettles Bays were closed west of the SHTF markers at the entrance to the bays.

“ Waters of the Coghill District were open, excluding the Esther Subdistrict and Pigot, Hummer and Bettles Bays, west of the SHTF markers at the entrance to the bays.

“ The waters of the Coghill District were open, excluding the WNH THA and SHA and Pigot, Hummer and Bettles Bays, west of the SHTF markers at the entrance to the bays.

“ The waters of the Coghill District were open, excluding the WNH SHA and Pigot, Hummer and Bettles Bays, west of the SHTF markers at the entrance to the bays.

“ The Coghill District, excluding the waters of Pigot, Hummer and Bettles Bays, west of the SHTF markers at the entrance to the bays, were open.

“ In the Coghill District, only the waters of the WNH SHA and THA were open.

“ The waters of the Esther Subdistrict, excluding the WNH THA and SHA, were open

Southwestern District

“ Within the Southwestern District, only the waters of the Armin F. Koenig (AFK) Special Harvest Area (SHA) were open.

“ Waters of the Port San Juan Subdistrict, Point Elrington Subdistrict and AFK Terminal Harvest Area (THA) were open.

“ Waters of the Port San Juan and Point Elrington Subdistricts were open.

“ Waters of the Point Elrington Subdistrict were open.

“ In the Southwestern District, the waters of the Point Elrington and Port San Juan Subdistricts, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude and north of the latitude of Point Helen were open.

“ In the Southwestern District, the waters of the AFK THA, Point Elrington and Port San Juan Subdistricts, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude and north of the latitude of Point Helen were open.

“ In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and AFK THA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest shore of Knight Island from Point Helen to the latitude of Squire Point were open.

“ In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and AFK THA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest shore of Knight Island from Point Helen to the latitude of Squire Point were open. Effective 8:00 a.m., Thursday, August 26, the area open was expanded to include the AFK SHA.

“ In the Southwestern District, the waters of the Point Elrington, Port San Juan Subdistricts and AFK THA and SHA, waters within one nautical mile of LaTouche Island and waters on the east side of Knight Island south of 60° 20' N. latitude to Point Helen and waters within one nautical mile of the southwest shore of Knight Island from Point Helen to the latitude of Squire Point were open.

“ Within the Southwestern District, only the waters of the AFK THA and SHA were open.

Montague District

“ Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory waters and anadromous salmon stream closures were not in effect

“ Within the Montague District, only the waters of the Port Chalmers Subdistrict were open. Regulatory waters and anadromous salmon stream closures were in effect. Regulatory closed waters markers in Port Chalmers were not in effect.

“ In the Montague District, waters east of line from Gilmour Point to the east end of Wilby Island were open. Regulatory waters and anadromous salmon stream closures were not in effect

“ Open waters included all of the Montague District. All anadromous salmon stream closures remained in effect.

Southeastern District

“ Open waters included all of the Southeastern District. All anadromous salmon stream closures remained in effect.

“ Within the Southeastern District only the waters west of the longitude of Middle Ground buoy were open.
All anadromous salmon stream closures remained in effect.

Appendix F.1. Daily salmon sales harvests and sex ratios at the Wally Noerenberg Hatchery, 1999.
 Broodstock and sex ratio data provided by the Prince William Sound
 Aquaculture Corporation.

HATCHERY SALES HARVEST IN NUMBERS OF FISH			
Date	Pink Salmon % Female	Pink	Chum
06/05		0	14,435
06/06		0	16,243
06/07		0	18,081
06/08		0	10,401
06/09		0	5,091
06/10		0	21,192
06/11		0	25,893
06/12		0	24,770
06/14		0	11,733
06/15		0	30,536
06/17		0	2,492
06/18		0	35,009
06/19		0	45,536
06/20		0	38,887
06/21		0	35,376
06/22		0	27,560
06/23		0	32,801
06/24		0	41,078
06/25		0	38,230
06/26		0	43,520
06/27		0	67,176
06/28		0	77,271
06/29		0	88,078
06/30		0	9,288
07/31	8.0%	31,180	3,052
08/01	8.0%	46,727	866
08/03	9.6%	92,521	4,233
08/04	9.6%	37,328	3,128
08/05	6.9%	10,194	455
08/06	14.0%	94,462	676
08/07		151,997	781
08/08		234,186	1,684
08/09	19.0%	53,982	0
08/10	19.0%	246,355	0
08/11	24.0%	308,051	0
08/12	27.0%	170,287	0
08/13	31.0%	307,899	0
08/15	39.0%	350,562	0

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HATCHERY SALES HARVEST IN NUMBERS OF FISH

Date	Pink Salmon % Female	Pink	Chum
08/16	45.0%	122,710	0
08/17	46.0%	328,519	0
08/19	52.1%	521,268	0
08/20	52.8%	46,307	0
08/21	56.0%	202,386	0
08/22	49.0%	41,886	0
08/23	60.8%	357,025	0
08/25	64.5%	38,234	0
08/26	58.8%	37,250	0
08/27	66.1%	29,115	0
Totals		3,860,431	775,552

SALES SUMMARY:

	Pink	Chum
Pounds Sold	10,540,230	6,602,618
Average Weights:	2.73	8.51
Roe Sales/Lbs:	10,032	28,655

BROODSTOCK SUMMARY:

	Pink	Coho	Chum
Fish spawned at hatchery	196,747	219	92,247
Green/bad/excess	72,771	154	74,022
Eggtake mortality	5,146	11	1,604
Total available broodstock	274,664	384	167,873
Surplus processed for roe/excessed	0	0	0
Estimated unharvested return	500,000	0	39,200
Estimated return to hatchery	774,664	384	207,073

Appendix F.2. Daily salmon sales harvests and sex ratios at the Armin F. Koernig Hatchery, 1999.
 Broodstock and sex ratio data provided by the Prince William Sound
 Aquaculture Corporation.

HATCHERY SALES HARVESTS IN NUMBERS OF FISH			
Date	Pink Salmon % Female	Pink	Chum
08/01	5.0%	24,970	0
08/03	5.1%	107,325	0
08/04	6.9%	52,522	944
08/05	9.3%	31,696	350
08/06	12.7%	74,417	0
08/07	12.8%	75,801	0
08/08	18.5%	74,526	0
08/09	16.5%	68,593	0
08/10	20.6%	86,403	0
08/11	18.9%	199,502	0
08/13	24.6%	267,931	0
08/14	27.5%	200,384	0
08/15	39.5%	137,852	0
08/16	38.6%	94,277	0
08/17	44.7%	220,206	0
08/18	48.0%	146,258	0
08/19	49.0%	139,330	0
08/20	51.4%	36,273	0
08/21	48.0%	164,211	0
08/22	49.0%	110,253	0
08/23	55.0%	334,748	0
08/24	53.2%	83,030	0
08/25	55.0%	84,252	0
Totals		2,814,760	1,294
SALES SUMMARY:		Pink	Chum
Pounds Sold		7,661,391	8,075
Average Weight:		2.72	6.24
Roe Sales		37,226	
PINK BROODSTOCK SUMMARY:		Pink	Chum
Spawned at hatchery		222,374	0
Excessed/green/bad		125,177	0
Fishway/system mortality		8,309	0
Total available broodstock		355,860	0
Surplus processed for roe/excessed		0	0
Estimated unharvested return		1,000,000	14,000
Estimated return to hatchery		1,355,860	14,000

Appendix F.3. Daily pink salmon sales harvests and sex ratios at the Solomon Gulch Hatchery, 1999. Sex ratios and broodstock data provided by the Valdez Fisheries Development Association, Inc.

HATCHERY SALES HARVESTS IN NUMBERS OF FISH			
Date	Pink	Chum	Sockeye
06/28	63,768	251	8
06/29	70,076	0	0
06/30	163,968	5	0
07/01	171,725	0	0
07/02	179,044	0	0
07/03	196,426	0	0
07/04	191,929	0	0
07/05	303,694	0	0
07/07	553,637	0	0
07/08	183,334	0	0
07/09	264,127	0	0
07/11	186,997	0	0
07/13	353,188	0	0
07/15	201,366	0	0
07/17	245,028	0	0
07/19	303,673	0	0
07/21	262,805	34	0
07/23	289,257	44	0
07/24	195,617	0	0
Totals	4,379,659	334	8

SALES SUMMARY:	pink	chum	sockeye	coho
Total Pounds Sold:	13,501,382	2356	49	0
Average Weights:	3.08	7.05	6.13	
Roe Sales (lbs.)	51,902	474	0	5,633

PINK BROODSTOCK SUMMARY:

Spawned at hatchery	192,956
Green/overripe/excessed/roe sales	199,789
System mortalities	33,460
Total available broodstock	426,205
Estimated creek spawners	72,908
Estimated fish in excess of needs	300,000
Roe sales	155,192
Estimated return to hatchery	954,305

COHO BROODSTOCK SUMMARY:

Spawned at hatchery	797
Green/overripe/excessed/roe sales	259
System mortalities	1,485
Total available broodstock	2,541
Estimated creek/bay spawners	0
Roe sales	12,679
Estimated return to hatchery	15,220

Appendix F.4. Daily pink salmon sales harvests and sex ratios at the Cannery Creek Hatchery, 1999. Broodstock and sex ratio data provided by the Prince William Sound Aquaculture Corporation.

HATCHERY SALES IN NUMBERS OF FISH		
Date	% Female	Pink
08/04	14.3%	12,649
08/05	7.6%	17,141
08/06	8.9%	26,710
08/09	15.1%	60,339
08/10	12.9%	66,213
08/11	15.1%	64,757
08/12	14.1%	134,603
08/14	27.9%	50,723
08/15	25.7%	50,054
08/16	31.5%	35,859
08/17	33.8%	109,699
08/18	34.0%	54,032
08/19	38.8%	134,764
08/20	42.6%	69,587
08/21	49.6%	196,941
08/22	38.4%	121,662
08/23	48.2%	186,571
08/24	50.1%	102,928
08/25	61.3%	104,353
08/26	60.6%	71,856
08/27	60.6%	131,179
08/28	60.6%	52,333
08/29	60.6%	113,816
08/30	60.6%	106,592
Totals		2,075,361

SALES SUMMARY:		Pink
Pounds Sold:		5,878,811
Average Weight:		2.83
Roe Sales (lbs)		11,628

PINK BROODSTOCK SUMMARY:		Pink
Spawned at hatchery		191,170
Green/bad/excess		77,692
Mortality		25,582
Total available broodstock		294,444
Surplus processed for roe		0
Estimated unharvested return		1,000,000
Estimated return to hatchery		1,294,444

Appendix F.5. Daily salmon sales harvests at the Crosswind Lake weir, 1999. Broodstock data provided by the Prince William Sound Aquaculture Corporation.

HATCHERY SALES HARVEST IN NUMBERS OF FISH

Date	Sockeye
08/09	200
08/10	1,432
08/11	1,773
08/12	1,842
08/13	1,328
08/14	626
08/15	2,717
08/16	3,241
08/17	3,017
08/18	3,026
08/19	1,856
08/20	3,346
08/21	2,520
08/23	1,187
08/24	242
08/25	416
Totals	28,769

SALES SUMMARY:	Sockeye
Pounds Sold	143,845
Average Weights:	5.00

GULKANA SOCKEYE BROODSTOCK SUMMARY:

Gulkana	
Good	17,017
Green/overripe	222
System mortalities/excessed/bad	653
Total available broodstock	17,892

Appendix F.6 Sales harvests of salmon by species from private nonprofit hatcheries as reported on fish tickets, Prince William Sound, 1977 - 1999.

Year	Hatchery ^b	Catch by Species ^a				Total
		Sockeye	Coho	Pink	Chum	
1977	AFK			15,545		15,545
1978	AFK			114,188		114,188
1979	AFK			223,748		223,748
1980	AFK, N			346,728	6	346,734
1981	AFK			707,037	118	707,155
1982	AFK			1,354,732		1,354,732
1983	AFK			616,963		616,963
1984	AFK, SG			415,393	4,886	420,279
1985	AFK, SG			1,209,960	3,840	1,213,800
1986	AFK, SG		2,156	905,464	20,683	928,303
1987 ^c	AFK, SG, E, CC		7,015	2,691,190	2,549	2,700,754
1988	AFK, SG, E		6,110	1,632,701	42,694	1,681,505
1989 ^d	AFK, SG, WNH, CC, MB		52,307	7,812,373	131,362	7,996,042
1990	AFK, SG, WNH, CC		14,199	8,732,658	24,554	8,771,411
1991	AFK, SG, WNH, CC		52,625	5,955,561	13,471	6,021,657
1992	AFK, SG, WNH, CC, MB	163,086	73,530	3,049,394	57,392	3,343,402
1993	AFK, SG, WNH, CC, MB	113,738	3,259	2,212,403	475,148	2,804,548
1994	AFK, SG, WNH, CC, MB	79,541	22,454	10,521,439	380,365	11,003,799
1995	AFK, SG, WNH, CC, MB	63,326	13,248	5,100,819	231,539	5,408,932
1996 ^c	AFK, SG, WNH, CC, MB	86,911	38,945	8,291,205	#####	9,483,744
1997	AFK, SG, WNH, CC, MB, G	266,335	2,933	9,854,675	811,179	10,935,122
1998	AFK, SG, WNH, CC, MB, G	148,288	20,199	8,825,226	519,215	9,512,928
1999	AFK, SG, WNH, CC, GH	28,777	0	13,130,211	777,180	13,936,168
TOTAL		950,002	308,980	93,719,613	#####	99,541,459

^a Includes salmon harvested by private nonprofit hatcheries in Prince William Sound to generate revenues to offset operating costs. Does not include carcass sales or fish processed only for roe extraction after egg takes.

^b Hatcheries: AFK = Armin F. Koernig (PWSAC) (formerly Port San Juan Hatchery)
E = Esther Hatchery (PWSAC), renamed WNH in 1989
SG = Solomon Gulch Hatchery (VFDA)
N = NERKA Inc.
CC = Cannery Creek (PWSAC) (formerly operated by ADF&G)
WNH = Wally Noerenberg Hatchery (PWSAC) (formerly Esther Hatchery)
MB = Main Bay (PWSAC) (formerly operated by ADF&G)
GH = Gulkana Hatchery (Crosswind Lake Weir) (formerly operated by ADF&G)

^c PWSAC administered a sales harvest at the state owned Cannery Creek hatchery. A majority of the coho salmon sold were carcasses and surplus brood fish from the Solomon Gulch hatchery.

^d PWSAC administered a sales harvest at the state owned Main Bay Hatchery to harvest a surplus of chum salmon due to closure of the common property fishery.

^e Includes 269,848 pink salmon Peter Pan Seafoods bought from VFDA and then discarded after roe salvage. Also includes approximately 250,000 chum processed by PWSAC for meal production and roe salvage.

Appendix F.7. Summary of pink and chum salmon returns to Prince William Sound hatcheries, 1999.

Pink salmon returns to P.W.S. hatcheries from otoliths^a

Hatchery	1998 Fry Release	1999 Forecast Return	Estimated Total Return	Marine Survival	Estimated C.P.F. Contribution	Estimated Sales Harvest Contribution ^b	Escmt. and Brood ^c	Eggs Taken (millions)
Solomon Gulch	195,162,063	6,500,000	14,401,376	7.4%	9,465,378	4,354,601	581,397	239
A. F. Koernig	105,947,235	5,200,000	8,389,898	7.9%	5,108,346	2,994,037	294,446	162
Wally Noerenberg	103,675,208	7,800,000	8,966,850	8.6%	4,828,682	3,861,691	274,664	130
Cannery Creek	137,571,564	6,600,000	7,722,850	5.6%	5,414,942	2,014,448	294,446	156
Total Pink Salmon	542,356,070	26,100,000	39,480,974	7.3%	24,817,348	13,224,777	1,444,953	687

Chum salmon returns to P.W.S. hatcheries

Hatchery	1998 Fry Release	1999 Forecast Return	Estimated Total Return	Estimated C.P.F. Comm Catch	Sales Harvest ^b	Escmt. and Brood ^c	Eggs Taken (millions)
A.F. Koernig	10,121,106	3,000	6,959	6,959	0	0	0
Wally Noerenberg	77,838,928	2,400,000	2,188,054	1,205,429	775,552	207,073	111
Port Chalmers	22,105,799	310,000	638,931	638,931	0	0	0
Total Chum Salmon	110,065,833	2,713,000	2,195,013	1,212,388	775,552	207,073	111

^a Contribution estimates of pink and chum salmon from PWS hatcheries are based on analysis of otolith recoveries and location of catch as reported on fish tickets.

^b Does not include carcass sales which are part of the broodstock.

^c Includes broodstock, overmature/green fish, holding mortalities, excess fish and fish processed for roe extraction. Does not include watershed spawners, unseen mortalities or fish remaining in the bay.

Appendix F.8. Historical catch contributions, thermally marked otolith releases, and total returns of pink salmon to Prince William Sound hatcheries, 1995 - 2000.

Solomon Gulch

Brood Year	Return Year	Fry Release	Thermal Mark Applied to Fry Release	Broodstock	Total Cost Recovery Harvest	Hatchery Contribution to CR Harvest	Hatchery Contribution to Other Harvest	Hatchery Contribution to the CPF	Total Hatchery Return	Estimated Marine Survival
1995	1997	233,088,327	233,088,327	356,271	2,431,007	2,428,010	0	4,005,264	6,789,545	2.9%
1996	1998	188,862,094	188,862,094	334,551	3,428,348	3,076,945	0	1,226,679	4,638,175	2.5%
1997	1999	195,162,163	195,162,163	581,397	4,379,659	4,354,601	0	9,465,378	14,401,376	2.5%
1998	2000	213,906,642	213,906,642							

Armin F. Koernig

Brood Year	Return Year	Fry Release	Thermal Mark Applied to Fry Release	Broodstock	Total Cost Recovery Harvest	Hatchery Contribution to CR Harvest	Hatchery Contribution to Other Harvest	Hatchery Contribution to the CPF	Total Hatchery Return	Estimated Marine Survival
1995	1997	108,636,976	108,636,976	0	3,206,683	3,139,053	0	3,815,265	6,954,318	6.4%
1996	1998	52,384,532	52,384,532	343,978	1,634,956	1,582,038	0	5,037,454	6,963,470	13.3%
1997	1999	148,323,538	148,323,538	294,446	2,814,760	2,994,037	0	5,108,346	8,389,898	7.9%
1998	2000	133,156,995	133,156,995							

Wally Noerenberg

Brood Year	Return Year	Fry Release	Thermal Mark Applied to Fry Release	Broodstock	Total Cost Recovery Harvest	Hatchery Contribution to CR Harvest	Hatchery Contribution to Other Harvest	Hatchery Contribution to the CPF	Total Hatchery Return	Estimated Marine Survival
1995	1997	176,431,919	176,431,919	409,455	2,280,868	2,321,255	0	3,464,254	6,194,964	3.5%
1996	1998	106,440,456	106,440,456	264,143	2,437,615	2,427,120	0	4,817,354	7,508,617	7.0%
1997	1999	103,675,208	103,675,208	274,664	3,860,431	3,861,891	0	4,828,682	8,966,850	8.6%
1998	2000	123,869,678	123,869,678							

Cannery Creek

Brood Year	Return Year	Fry Release	Thermal Mark Applied to Fry Release	Broodstock	Total Cost Recovery Harvest	Hatchery Contribution to CR Harvest	Hatchery Contribution to Other Harvest	Hatchery Contribution to the CPF	Total Hatchery Return	Estimated Marine Survival
1995	1997	140,441,131	140,441,131	319,329	1,897,259	1,852,317	0	3,608,272	5,779,918	4.1%
1996	1998	136,838,852	136,838,852	304,945	1,324,307	1,305,144	0	4,869,014	6,479,103	4.7%
1997	1999	137,571,564	137,571,564	294,446	2,076,361	2,014,448	0	5,414,942	7,722,850	5.6%
1998	2000	131,195,588	131,195,588							

Appendix F.9. Estimated total hatchery and wild stock production of pink salmon, Prince William Sound, 1977 - 1999.

Year ^b	Total Return by Hatchery ^a					Total Hatchery Production	Total Wild Stock Component ^c	Revised Total Hatchery Production ^d	Revised Total Wild Stock Component ^d
	Solomon Gulch (VFDA)	Armin F Koernig (PWSAC)	Wally Noerenberg (PWSAC)	Main Bay (ADF&G - PWSAC)	Cannery Cr. (ADF&G - PWSAC)				
1977		27,857				27,857	5,816,401		
1978		154,620				154,620	3,925,083		
1979		552,955				552,955	17,335,503		
1980		1,493,489			90,348	1,583,837	14,013,916		
1981		2,264,854			141,440	2,406,294	19,568,866		
1982		5,134,363		35,000	764,214	5,933,577	16,794,317		
1983	91,445	3,722,502		496,850	469,441	4,780,238	11,567,348		
1984	131,075	2,800,000		1,200,000	1,139,000	5,270,075	21,201,513		
1985	485,607	5,030,616		383,000	2,594,000	8,493,223	19,938,105		
1986	1,217,250	4,964,000		232,000	853,000	7,266,250	5,563,957		
1987	5,290,321	7,613,161	3,011,955	328,000	2,131,726	18,375,163	13,066,944		
1988	1,034,204	6,076,493	3,866,618	100,000	227,688	11,305,003	1,766,936		
1989	3,297,851	2,628,627	5,718,794	0	5,540,665	17,185,937	6,610,342	20,100,598	3,695,681
1990	8,923,567	6,809,090	13,553,591	^d	2,534,297	31,820,545	14,418,696	34,445,983	11,793,258
1991	5,691,176	5,117,569	11,690,234	0	8,501,296	31,000,275	9,295,456	34,326,949	5,940,967
1992	1,864,031	2,391,140	2,006,127	0	1,519,716	7,781,014	2,203,701	9,085,482	899,233
1993	1,112,314	1,528,425	1,492,039	0	712,223	4,845,001	2,875,916	6,877,320	836,282
1994	12,735,021	1,744,142	6,145,508	0	9,640,886	30,265,557	9,501,683	36,702,094	3,065,146
1995	6,765,357	856,048	2,314,276	0	5,072,900	15,008,581	3,401,469	15,523,888	2,886,162
1996	6,990,211	1,766,881	5,136,516	0	6,516,672	20,410,280	8,374,327	25,643,041	3,141,566
1997	7,012,054	6,605,685	5,571,768	0	4,513,121	23,702,628	4,596,623	26,004,197	2,295,054
1998 ^e	4,638,175	6,963,470	7,508,617	0	6,479,103	25,589,365	5,254,369		
1999 ^e	14,401,376	8,389,898	8,966,850	0	7,722,850	39,480,974	9,426,391		

^aPrior to 1987, there was no definitive or statistically valid method of separating hatchery and wild stock composition in the commercial catch. The above estimates are based on presumed wild stock exploitation rates which in turn are determined by the wild stock escapement estimate. The wild stock escapement index is only a minimum estimate. The true wild stock escapement is not known. Consequently estimates prior to 1987 may exaggerate hatchery contributions somewhat. In 1987 returning adults from the Cannery Creek, Armin F. Koernig and Esther hatcheries were marked with half length coded wire tags (CWT). In a jointly funded program conducted by ADF&G and PWSAC, these marked fish were recovered and analyzed to estimate hatchery contributions to the fishery (Geiger, 1990).

^bHatchery totals include cost recovery harvests, broodstock collection and escapement, and estimated common property fishery interception.

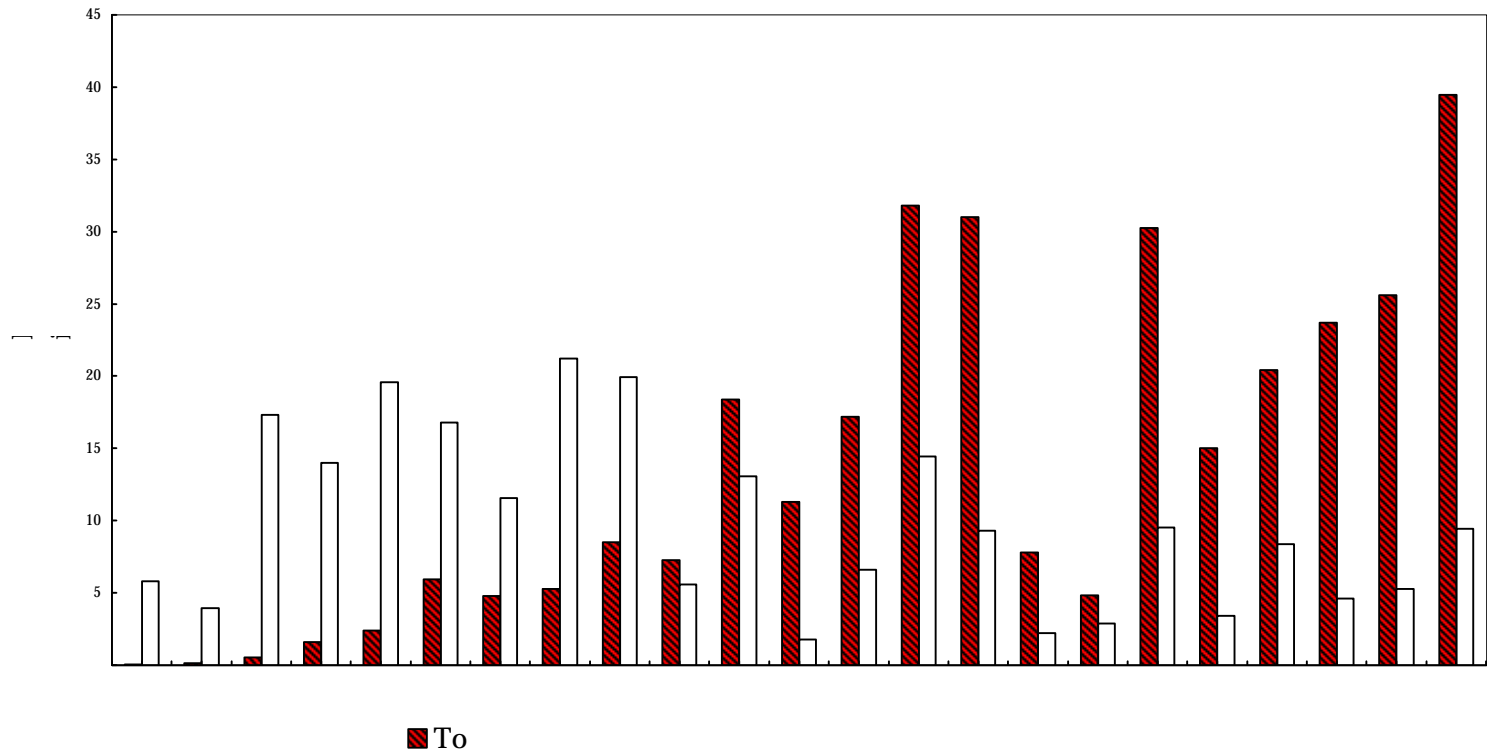
^cTotal wild stock return represents the estimated wild stock catch plus the aerial escapement index. 1999 wild stock component = 6,963,529 catch plus 2,462,862 escapement index.

^dRevised contribution based on individual hatchery CWT adjustment factors.

^eHatchery totals from otoliths.

Hatchery and Wild Stock Pink Salmon Returns

Prince William Sound



Appendix F.10. Estimated total pink salmon returns to hatcheries and wild stock systems, Prince William Sound, 1977 - 1999.

Appendix F.11. Historical catch contributions, coded wire tag (CWT) and thermally marked otolith releases, and total returns of pink salmon to all hatcheries combined, Prince William Sound, 1977 - 1999.

Brood Year	Return Year	Fry Release ^a	CWT/Otolith Applied to Fry Release ^b	Broodstock ^a	Total Cost Recovery Harvest ^c	Hatchery Contribution to CR Harvest ^b	Hatchery Contribution to Other Harvest ^d	Hatchery Contribution to the CPF ^a	Total Hatchery Return	Estimated Marine Survival	Revised Total Hatchery Return ^e	Revised Estimated Marine Survival ^e
1975	1977	1,000,000	0	16,112	15,545	7,745	0	4,000	27,857	2.79%		
1976	1978	11,010,577	0	40,432	114,188	114,188	0	0	154,620	1.40%		
1977	1979	16,950,784	0	54,207	223,748	223,748	0	275,000	552,955	3.26%		
1978	1980	25,600,739	0	145,061	346,728	346,728	0	1,092,048	1,583,837	6.19%		
1979	1981	24,194,000	0	268,501	707,037	707,037	0	1,430,747	2,406,285	9.95%		
1980	1982	91,076,000	0	239,945	1,354,732	1,354,732	0	4,303,900	5,898,577	6.48%		
1981	1983	91,951,000	0	258,062	686,963	686,963	0	3,338,366	4,283,391	4.66%		
1982	1984	115,107,533	0	341,259	415,393	415,393	0	3,313,423	4,070,075	3.54%		
1983	1985	116,336,000	0	640,340	1,209,960	1,209,960	0	6,259,923	8,110,223	6.97%		
1984	1986	191,306,265	0	466,471	905,464	905,464	0	5,662,315	7,034,250	3.68%		
1985	1987	231,538,713	646,561	1,158,908	2,691,190	2,691,190	0	14,197,065	18,047,163	7.79%		
1986	1988	218,830,647	568,688	824,302	1,632,701	1,632,701	0	8,748,000	11,205,003	5.12%		
1987	1989	532,045,966	939,498	856,927	7,853,419	5,767,911	0	10,561,099	17,185,937	3.23%	20,100,598	3.78%
1988	1990	507,688,297	1,074,099	749,910	8,732,658	6,691,160	0	24,379,475	31,820,545	6.27%	34,445,983	6.78%
1989	1991	615,139,948	1,128,899	1,324,255	6,119,141	5,201,860	3,573,805	20,900,355	31,000,275	5.04%	34,326,949	5.58%
1990	1992	603,519,636	1,091,403	789,880	3,049,394	2,626,248	30,290	4,345,805	7,792,223	1.29%	9,085,482	1.51%
1991	1993	495,700,200	823,128	921,073	2,639,982	1,544,727	14,648	2,392,162	4,872,610	0.98%	6,877,320	1.39%
1992	1994	567,320,470	950,976	1,422,306	10,308,169	7,613,582	56,396	21,173,273	30,265,557	5.33%	36,702,094	6.47%
1993	1995	488,575,978	941,811	1,154,635	5,057,418	4,703,457	78,020	9,072,469	15,008,581	3.07%	15,523,888	3.18%
1994	1996	613,158,229	1,017,782	544,531	8,285,166	5,363,551	0	14,502,198	20,410,280	3.33%	25,643,041	4.18%
1995	1997	651,675,427 ^f	1,079,354	841,448	9,776,254	8,907,382	0	13,953,798	23,702,628	3.64%	26,004,197	3.99%
1996	1998	484,525,934 ^f	484,525,934	1,247,617	8,825,226	8,391,247	0	15,950,501	25,589,365	5.28%		
1997	1999	542,356,070 ^f	542,356,070	1,444,953	13,131,211	13,224,977	0	24,817,348	39,480,974	7.28%		

^a Data for BY 1985 and 1987 - 1995 provided by the ADF&G CWT project. PWSAC provided data for all other years. Starting in 1994, broodstock number includes fish processed for roe as reported by PWSAC.

^b Data for brood years 1985 - 1995 years provided by the ADF&G CWT project, succeeding years data from thermally marked otoliths. Sales numbers include inter-hatchery contributions.

^c Data for all years from ADF&G fish ticket information.

^d Includes donated and/or discarded fish in 1991. Data provided by the ADF&G CWT project.

^e Revised contribution based on individual hatchery CWT adjustment factors.

^f All BY 1995 - 1997 fry released bore thermal otolith marks.

Appendix F.12. Hatchery contributions to the common property pink salmon seine fishery in the Eastern District, Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
01	07/06	717,177	96.9	0	0.0	0	0.0	0	0.0	23,135	3.1	740,312
02	07/10	929,622	100.0	0	0.0	0	0.0	0	0.0	0	0.0	929,622
03	07/12	1,294,009	97.9	0	0.0	0	0.0	0	0.0	27,828	2.1	1,321,837
04	07/14	1,152,519	91.7	0	0.0	0	0.0	0	0.0	104,774	8.3	1,257,293
05	07/16	1,471,627	98.9	0	0.0	0	0.0	0	0.0	15,656	1.1	1,487,283
06	07/18	1,326,196	99.0	0	0.0	0	0.0	0	0.0	13,960	1.0	1,340,156
07	07/20	771,895	90.3	0	0.0	0	0.0	0	0.0	82,703	9.7	854,598
08	07/22	541,961	84.4	0	0.0	0	0.0	0	0.0	100,363	15.6	642,324
09	07/25	382,405	68.8	5,975	1.1	0	0.0	11,950	2.2	155,352	28.0	555,682
10	07/27	201,132	43.7	5,293	1.1	0	0.0	0	0.0	254,061	55.2	460,486
11	07/29-07/30	241,553	48.4	0	0.0	0	0.0	0	0.0	257,306	51.6	498,859
12	07/31-08/01	153,129	29.5	5,469	1.1	0	0.0	0	0.0	360,948	69.5	519,546
13	08/02	66,114	14.7	9,445	2.1	4,722	1.1	4,722	1.1	363,625	81.1	448,628
14	08/04	10,682	3.2	10,682	3.2	7,121	2.1	0	0.0	309,774	91.6	338,259
15	08/06	18,776	5.4	3,755	1.1	0	0.0	0	0.0	322,956	93.5	345,487
16	08/08-08/09	6,505	2.2	0	0.0	0	0.0	3,252	1.1	289,452	96.7	299,209
17	08/10	2,496	2.0	2,496	2.0	0	0.0	2,496	2.0	119,796	94.1	127,284
18	08/12	230	2.0	230	2.0	0	0.0	230	2.0	11,042	94.1	11,732
19	08/14	0	0.0	0	0.0	0	0.0	0	0.0	20,410	100.0	20,410
20	08/16	0	0.0	0	0.0	0	0.0	0	0.0	10,936	100.0	10,936
21	08/18	0	0.0	0	0.0	0	0.0	0	0.0	23,233	100.0	23,233
22	08/20	0	0.0	0	0.0	0	0.0	0	0.0	9,291	100.0	9,291
25	08/25-08/27	0	0.0	0	0.0	0	0.0	0	0.0	16,263	100.0	16,263
26	08/28-08/31	41,500	100.0	0	0.0	0	0.0	0	0.0	0	0.0	41,500
27	09/01-09/03	0	0.0	0	0.0	0	0.0	0	0.0	5,351	100.0	5,351
29	09/08-09/10	0	0.0	0	0.0	0	0.0	0	0.0	48	100.0	48
Total		9,329,528	75.8	43,345	0.4	11,843	0.1	22,650	0.2	2,898,263	23.6	12,305,629

Appendix F.13. Hatchery contributions to the common property pink salmon seine fishery in the Northern District, Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
01	07/25	15,053	62.9	1,368	5.7	0	0.0	0	0.0	7,527	31.4	23,948
02	07/27	15,127	62.9	1,375	5.7	0	0.0	0	0.0	7,564	31.4	24,066
03	07/29	539	8.0	3,504	52.0	270	4.0	0	0.0	2,426	36.0	6,739
04	07/31	5,382	8.0	34,985	52.0	2,691	4.0	0	0.0	24,220	36.0	67,278
05	08/02	9,213	12.5	38,898	52.8	2,047	2.8	0	0.0	23,543	31.9	73,701
06	08/04	18,478	15.7	63,961	54.2	4,264	3.6	0	0.0	31,269	26.5	117,972
07	08/06	16,758	7.7	137,416	63.1	26,813	12.3	0	0.0	36,867	16.9	217,854
08	08/08	0	0.0	210,559	60.0	84,962	24.2	7,388	2.1	48,022	13.7	350,931
09	08/10	0	0.0	278,174	41.5	226,236	33.8	25,849	3.9	139,630	20.8	669,889
10	08/12	0	0.0	609,190	83.0	70,291	9.6	0	0.0	54,671	7.4	734,152
11	08/14	0	0.0	459,785	86.0	28,737	5.4	5,747	1.1	40,231	7.5	534,500
12	08/16	0	0.0	453,656	88.3	21,863	4.3	0	0.0	38,260	7.4	513,779
13	08/18	0	0.0	374,379	82.7	61,428	13.6	7,932	1.8	8,706	1.9	452,445
14	08/20	0	0.0	328,978	90.5	22,952	6.3	0	0.0	11,476	3.2	363,406
15	08/22	0	0.0	78,248	90.5	1,820	2.1	0	0.0	6,369	7.4	86,437
16	08/24	0	0.0	70,920	90.5	0	0.0	0	0.0	7,422	9.5	78,342
18	08/28-08/31	0	0.0	13,581	100.0	0	0.0	0	0.0	0	0.0	13,581
19	09/01-09/03	0	0.0	17,020	100.0	0	0.0	0	0.0	0	0.0	17,020
20	09/04-09/07	0	0.0	43,316	100.0	0	0.0	0	0.0	0	0.0	43,316
21	09/08-09/10	0	0.0	279,075	100.0	0	0.0	0	0.0	0	0.0	279,075
22	09/11-09/14	0	0.0	312,654	100.0	0	0.0	0	0.0	0	0.0	312,654
Total		80,550	1.6	3,811,042	76.5	554,374	11.1	46,916	0.9	488,203	9.8	4,981,085

Appendix F.14. Hatchery contributions to the common property pink salmon drift gillnet and seine fisheries in the Coghill District,
Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
03	06/24-06/25	0	0.0	0	0.0	0	0.0	0	0.0	7	100.0	7
06	07/02	0	0.0	0	0.0	0	0.0	0	0.0	8	100.0	8
07	07/04-07/06	0	0.0	0	0.0	0	0.0	0	0.0	85	100.0	85
08	07/06-07/09	0	0.0	0	0.0	0	0.0	0	0.0	303	100.0	303
09	07/09-07/13	209	6.2	105	3.1	628	18.8	0	0.0	2,406	71.9	3,348
10	07/13-07/16	528	6.3	264	3.1	1,583	18.7	0	0.0	6,070	71.9	8,445
11	07/16-07/20	1,253	6.3	627	3.1	3,757	18.7	0	0.0	14,402	71.9	20,039
12	07/20-07/21	100	6.3	50	3.1	300	18.8	0	0.0	1,149	71.9	1,599
13	07/22	676	6.3	338	3.1	2,027	18.8	0	0.0	7,769	71.9	10,810
14	07/25	0	0.0	0	0.0	1,077	33.3	0	0.0	2,155	66.7	3,232
15	07/27	0	0.0	0	0.0	2,796	33.3	0	0.0	5,596	66.7	8,392
16	07/29-07/30	0	0.0	0	0.0	6,265	33.3	0	0.0	12,536	66.7	18,801
17	07/31	0	0.0	0	0.0	5,047	33.3	0	0.0	10,100	66.7	15,147
18	08/02	0	0.0	7,783	26.3	21,793	73.7	0	0.0	0	0.0	29,576
19	08/04-08/05	0	0.0	36,677	26.3	102,694	73.7	0	0.0	0	0.0	139,371
20	08/06-08/07	0	0.0	62,917	20.2	196,959	63.2	0	0.0	51,975	16.7	311,851
21	08/08-08/09	0	0.0	71,340	42.7	67,263	40.2	0	0.0	28,536	17.1	167,139
22	08/10	0	0.0	3,171	31.2	6,343	62.5	0	0.0	634	6.2	10,148
24	08/14	0	0.0	65,834	17.3	294,521	77.3	3,465	0.9	17,325	4.5	381,145
25	08/16	0	0.0	39,103	7.4	474,826	90.4	0	0.0	11,173	2.1	525,102
26	08/18	0	0.0	8,551	2.7	293,580	93.6	5,701	1.8	5,700	1.8	313,532
27	08/20	0	0.0	18,729	9.4	175,589	88.2	0	0.0	4,682	2.4	199,000
28	08/22	0	0.0	9,253	5.6	151,139	90.7	0	0.0	6,169	3.7	166,561
29	08/24	0	0.0	10,578	5.2	188,284	92.7	0	0.0	4,231	2.1	203,093
30	08/25-08/27	0	0.0	5,100	2.1	211,654	87.4	20,400	8.4	5,101	2.1	242,255
31	08/28-08/31	0	0.0	0	0.0	289,688	100.0	0	0.0	0	0.0	289,688
32	09/01-09/03	0	0.0	0	0.0	157,728	100.0	0	0.0	0	0.0	157,728
33	09/04-09/07	0	0.0	0	0.0	294,674	100.0	0	0.0	0	0.0	294,674
35	09/11-09/14	0	0.0	0	0.0	21,051	100.0	0	0.0	0	0.0	21,051
Total		2,766	0.1	340,420	9.6	2,971,266	83.9	29,566	0.8	198,112	5.6	3,542,130

Appendix F.15. Hatchery contributions to the common property pink salmon drift and set gillnet fisheries in the Eshamy District,
Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
01	7/15-7/16	0	0.0	0	0.0	767	21.4	256	7.2	2,557	71.4	3,580
02	7/19-7/20	0	0.0	0	0.0	1,871	21.4	624	7.1	6,236	71.4	8,731
03	7/22-7/23	0	0.0	0	0.0	1,030	21.4	343	7.1	3,435	71.4	4,808
04	7/26-7/27	0	0.0	0	0.0	1,541	21.4	514	7.1	5,137	71.4	7,192
05	7/29-7/30	0	0.0	0	0.0	1,516	21.4	505	7.1	5,054	71.4	7,075
06	08/02-08/03	0	0.0	0	0.0	3,041	21.4	1,014	7.1	10,138	71.4	14,193
07	08/05-08/06	0	0.0	0	0.0	4,436	21.4	1,479	7.1	14,787	71.4	20,702
08	08/09-08/10	0	0.0	0	0.0	540	21.4	180	7.1	1,798	71.4	2,518
09	08/12-08/13	0	0.0	0	0.0	2,182	21.4	728	7.1	7,274	71.4	10,184
10	08/16-08/17	0	0.0	0	0.0	5,788	54.5	965	9.1	3,858	36.4	10,611
11	08/19-08/20	0	0.0	0	0.0	6,801	54.5	1,134	9.1	4,534	36.4	12,469
12	08/23-08/24	0	0.0	0	0.0	9,613	54.5	1,603	9.1	6,409	36.4	17,625
13	08/26-08/27	0	0.0	0	0.0	14,557	66.7	2,911	13.3	4,367	20.0	21,835
14	08/30-8/31	0	0.0	0	0.0	9,968	66.7	1,993	13.3	2,990	20.0	14,951
15	09/02-09/03	0	0.0	0	0.0	5,775	66.7	1,155	13.3	1,732	20.0	8,662
16	09/06-09/07	0	0.0	0	0.0	3,593	66.7	718	13.3	1,078	20.0	5,389
Total		0	0.0	0	0.0	73,019	42.8	16,122	9.5	81,384	47.7	170,525

Appendix F.16. Hatchery contributions to the common property pink salmon seine fishery in the Southwestern District,
Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
04	07/27	17,873	27.5	3,763	5.8	8,466	13.0	5,644	8.7	29,161	44.9	64,907
05	07/29	21,294	13.5	4,914	3.1	18,018	11.5	21,294	13.5	91,725	58.3	157,245
06	08/02	11,764	3.2	50,978	13.7	54,899	14.7	47,057	12.6	207,833	55.8	372,531
07	08/04	5,382	1.0	53,815	10.4	107,631	20.8	182,972	35.4	166,827	32.3	516,627
08	08/08	8,721	1.1	104,656	12.6	122,098	14.7	366,294	44.2	226,754	27.4	828,523
09	08/10	0	0.0	78,641	13.5	114,937	19.8	223,825	38.5	163,331	28.1	580,734
10	08/12	0	0.0	192,780	17.7	204,120	18.7	521,640	47.9	170,101	15.6	1,088,641
11	08/14	9,000	1.1	126,002	14.7	108,001	12.6	423,005	49.5	189,003	22.1	855,011
12	08/16	0	0.0	97,198	11.6	114,871	13.7	547,844	65.3	79,526	9.5	839,439
13	08/18	0	0.0	131,443	17.9	77,319	10.5	402,062	54.7	123,711	16.8	734,535
14	08/20	0	0.0	128,636	16.8	64,318	8.4	450,227	58.9	120,596	15.8	763,777
15	08/22	0	0.0	38,967	7.3	58,450	10.9	375,057	70.0	63,322	11.8	535,796
16	08/24	0	0.0	14,782	3.2	44,345	9.5	285,781	61.1	123,181	26.3	468,089
17	08/25-08/27	0	0.0	68,398	19.8	41,799	12.1	136,796	39.6	98,798	28.6	345,791
18	08/28-08/31	0	0.0	83,640	19.8	51,114	12.1	167,280	39.6	120,814	28.6	422,848
19	09/01-09/03	0	0.0	21,126	19.8	12,911	12.1	42,252	39.6	30,516	28.6	106,805
20	09/04-09/07	0	0.0	13,329	19.8	8,145	12.1	26,658	39.6	19,253	28.6	67,385
22	09/11-09/14	0	0.0	0	0.0	0	0.0	18,330	100.0	0	0.0	18,330
23	09/15-09/17	0	0.0	0	0.0	0	0.0	199,695	100.0	0	0.0	199,695
24	09/18-09/21	0	0.0	0	0.0	0	0.0	333,778	100.0	0	0.0	333,778
25	09/22-09/24	0	0.0	0	0.0	0	0.0	178,630	100.0	0	0.0	178,630
26	09/25-09/28	0	0.0	0	0.0	0	0.0	32,881	100.0	0	0.0	32,881
Total		74,034	0.8	1,213,068	12.8	1,211,442	12.7	4,989,002	52.4	2,024,452	21.3	9,511,998

Appendix F.17. Hatchery contributions to the common property pink salmon seine fishery in the Montague District,
Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
06	06/19-06/22	0	0.0	0	0.0	0	0.0	0	0.0	20	100.0	20
07	06/23-06/25	0	0.0	0	0.0	0	0.0	0	0.0	64	100.0	64
08	06/26-06/29	0	0.0	0	0.0	0	0.0	0	0.0	1,245	100.0	1,245
09	06/30-07/02	0	0.0	0	0.0	0	0.0	0	0.0	763	100.0	763
10	07/03-07/06	0	0.0	0	0.0	0	0.0	0	0.0	248	100.0	248
11	07/07-07/09	0	0.0	0	0.0	0	0.0	0	0.0	4,875	100.0	4,875
12	07/10-07/13	0	0.0	0	0.0	0	0.0	0	0.0	175	100.0	175
13	07/14-07/16	0	0.0	0	0.0	0	0.0	0	0.0	48	100.0	48
14	07/20	0	0.0	0	0.0	0	0.0	0	0.0	245	100.0	245
16	07/31	0	0.0	0	0.0	1,195	5.6	0	0.0	20,306	94.4	21,501
17	08/04	0	0.0	5,543	4.7	5,543	4.7	0	0.0	107,156	90.6	118,242
18	08/06	0	0.0	0	0.0	0	0.0	0	0.0	42,215	100.0	42,215
Total		0	0.0	5,543	2.9	6,738	3.6	0	0.0	177,360	93.5	189,641

Appendix F.18. Hatchery contributions to the common property pink salmon seine fishery in the Southeastern District,
Prince William Sound, 1999.

Period	Catch Date	SGH	%	CCH	%	WNH	%	AFK	%	Wild	%	Total
04	07/22	0	0.0	0	0.0	0	0.0	0	0.0	799	100.0	799
05	07/25	0	0.0	0	0.0	0	0.0	0	0.0	105,244	100.0	105,244
06	07/27	0	0.0	0	0.0	0	0.0	1,169	2.7	42,664	97.3	43,833
07	07/29	0	0.0	0	0.0	0	0.0	0	0.0	22,953	100.0	22,953
08	07/31	0	0.0	0	0.0	0	0.0	0	0.0	43,466	100.0	43,466
09	08/02	0	0.0	200	1.1	0	0.0	200	1.1	18,202	97.8	18,602
10	08/04	0	0.0	1,324	1.1	0	0.0	1,324	1.1	120,529	97.9	123,177
11	08/06	0	0.0	0	0.0	0	0.0	0	0.0	274,956	100.0	274,956
12	08/08-08/09	0	0.0	0	0.0	0	0.0	0	0.0	207,996	100.0	207,996
13	08/10	0	0.0	0	0.0	0	0.0	1,397	2.0	67,041	98.0	68,438
16	08/16	0	0.0	0	0.0	0	0.0	0	0.0	5,443	100.0	5,443
Total		0	0.0	1,524	0.2	0	0.0	4,090	0.4	909,293	99.4	914,907

Appendix G.1. Subsistence salmon harvest by species and gear type, Prince William Sound and Upper Copper River, 1999.

Area	Permits Issued	Permits Fished	Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Other ^a	Total
Prince William Sound	3	0	Drift Gillnet	0	0	0	0	0	0	0
	0	0	Purse Seine	0	0	0	0	0	0	0
	0	0	Set Gillnet	0	0	0	0	0	0	0
P.W.S. TOTAL	3	0		0	0	0	0	0	0	0
Copper River Flats	294	172	Drift Gillnet	353	1,330	682	3	8	3	2,379
Upper Copper River	336	292	Dip Net	351	8,937	86	0	0	37	9,411
	765	721	Fish Wheel	2,707	63,964	206	0	0	290	67,167
Eastern	17	8	Drift Gillnet and Dip Net	0	344	541	31	31	0	947
Southwestern	14	7	Drift Gillnet and Dip Net	57	499	62	168	101	0	887
Batzulnetas	1	1	Fish Wheel	0	55	0	0	0	0	55
Total	1,430	1,201		3,468	75,129	1,577	202	140	330	80,846

^aIncludes flounder and Dolly Varden as well as misc. salmon species.

Appendix G.2. Salmon catch and effort in the Prince William Sound subsistence fishery, 1960 - 1999.

Year	Permits		Catch ^a						Total
	Issued	Returned	Chinook	Sockeye	Coho	Pink	Chum	Unknown	
1960	50		1	139	505	1,292	75	150	2,162
1961	12		3	41	123	732	3		902
1962	9				119	214	142		475
1963	9				406	298	24		728
1964	15			11		900			911
1965	22	16				179	25		204
1966	3	3		3	19	20	50		92
1967	4	3			4	4			8
1968	4	3			20	156		22	198
1969	7	3			16				16
1970	1	1							0
1971	3	2				46			46
1972	0								0
1973	19	16			289				289
1974	3	1							0
1975	2	0							0
1976	0								0
1977	4	4							0
1978	3	2							0
1979	15	2							0
1980	26	15		7	6				13
1981	12	8		3	29		2		34
1982	35	27		84	4	31	24		143
1983	26	21		22	36	9	79		146
1984	8	8		10		11	2		23
1985	22	16	1	27	16	14	26		84
1986	25	14		5	15				20
1987	18	17	5	31	6		16		58
1988	7	7	2	51	7	10	9		79
1989	11	7	0	0	0	0	3	0	3
1990	8	8	0	0	7	4	0	0	11
1991	9	5	0	2	0	0	0	0	2
1992	10	6	0	20	0	0	0	0	20
1993	6	6	1	104	10	0	0	0	115
1994	5	4	0	0	0	0	0	0	0
1995	4	2	0	0	0	0	0	0	0
1996	10	7	0	0	0	0	0	0	0
1997	4	3	0	3	0	0	0	0	3
1998	4	3	0	0	0	0	0	0	0
1999	3	3	0	0	0	0	0	0	0

^a Includes catches from Prince William Sound, exclusive of the Copper River Flats.

Appendix G.3. Salmon catch and effort in the Copper River District subsistence gillnet fishery, 1965-1999.

Year	Total Issued	Permits Issued			Catch			Total
		Fished ^a	Not Fished	Not returned	Chinook	Sockeye	Coho	
1965	31	15	5	11	12	459	85	556
1966	45	21	10	14	47	175		222
1967	61	37	19	5	83	153		236
1968	17	7	8	2	11	36		47
1969	49	20	13	16	16	63	85	164
1970	32	24	3	5	66	179		245
1971	29	17	9	3	10	32	4	46
1972	104	75	5	24	149	569	53	771
1973	94	89	N/A	5	153	326	180	659
1974	9	3	2	4	5	4	2	11
1975	2	2	N/A	0	0	5	0	5
1976	27	14	N/A	13	1	10	0	11
1977	23	22	N/A	1	10	71	0	81
1978	34	9	19	6	37	18	12	67
1979	49	21	20	8	45	26	17	88
1980	39	18	17	4	19	27	17	63
1981	72	30	21	21	48	145	104	297
1982	108	48	42	18	60	634	106	802 ^b
1983	87	31	42	14	79	107	57	254 ^b
1984	118	57	47	14	68	324	135	549 ^b
1985	94	67	27	0	88	261	83	433 ^b
1986	88	57	28	3	86	348	47	481 ^b
1987	95	39	50	6	49	359	14	510 ^b
1988	114	57	40	17	59	226	42	440 ^b
1989	75	32	32	11	56	339	51	454 ^b
1990	88	38	38	12	60	469	82	611 ^b
1991	129	72	43	14	136	830	38	1,009 ^b
1992	126	67	46	13	142	785	42	999 ^b
1993	111	50	43	18	120	428	29	601 ^b
1994	101	60	37	4	164	474	67	708 ^b
1995	126	72	40	14	154	692	31	880 ^b
1996	176	101	56	19	276	969	47	1,292
1997	269	165	78	26	201	1,033	1,777	3,022 ^b
1998	245	144	86	15	295	850	680	1,832 ^b
1999	294	172	103	19	353	1,330	682	2,379 ^b

^aIncludes all permit holders, successful or unsuccessful.

^bTotal also includes pink, chum and dolly varden.

Appendix G.4. Salmon catch and effort in the Eastern District (Tatitlek) and Southwest (Chenega) subsistence fisheries, Prince William Sound, 1988 - 1999.

Year	Permits		Catch						
	Issued	Fished	Chinook	Sockeye	Coho	Pink	Chum	Unknown	Total
EASTERN									
1988	17	9	2	210	249	143	297	0	901
1989	14	7	1	107	653	28	43	0	832
1990	13	8	0	5	241	10	4	0	260
1991	19	7	0	107	984	320	28	0	1,439
1992	15	5	2	441	369	30	49	0	891
1993	18	7	2	512	305	144	74	180	1,217
1994	14	4	0	50	143	50	70	0	313
1995 ^a	15								
1996	6	1	0	0	38	0	0	0	38
1997	6	3	0	107	45	0	54	0	206
1998	11	2	0	2	71	4	28	0	105
1999	17	8		344	541	31	31	0	947
SOUTHWESTERN									
1988	10	5	1	50	8	251	294	0	604
1989	8	7	0	322	0	554	180	0	1,056
1990	7	2	1	36	5	20	2	0	64
1991	12	4	3	345	42	195	53	0	638
1992	14	8	1	526	23	313	99	0	962
1993	22	17	2	835	50	232	124	0	1,243
1994	16	8	5	192	77	402	161	0	837
1995	10	5	2	152	67	67	41	0	329
1996	7	3	0	107	7	105	46	0	265
1997	5	4	44	193	30	110	272	0	649
1998	4	3	13	114	20	65	119	0	331
1999	14	7	57	499	62	168	101	0	887

^a No permits were returned.

Appendix G.5. Salmon catch by species and numbers of permits by gear type for the Upper Copper River subsistence and personal use fisheries, 1981 - 1999.

Year	Permits Issued			Reported Catch ^a			Reported Catch by Species			Total Salmon Catch	
	Dip Net	Fish Wheel	Total	% Dip Net	% Fish Wheel	Total	Chinook	Sockeye	Coho	Reported	Estimated
1981	3,555	523	4,078	52%	48%	55,796	1,913	53,008	849	55,770	68,654
1982	5,475	615	6,090	62%	38%	100,734	2,532	96,799	1,246	100,577	109,557
1983	6,911	630	7,541	67%	33%	108,228	5,421	100,995	1,690	108,106	118,599
1984 s	104	458	562	6%	94%	20,597	366	20,101	120	20,587	28,617
p	5,311	17	5,328	100%		46,241	1,592	44,079	552	46,223	50,714
s&p	5,415	475	5,890	70%	30%	67,903	2,007	65,078	789	67,874	79,331
1985	4,153	533	5,686	57%	43%	52,733	1,673	50,488	544	52,705	64,164
1986 s ^b	39	366	405	3%	97%	25,781	622	24,890	264	25,776	28,417
p	3,966	65	4,031	98%	2%	42,695	2,294	39,794	521	42,609	44,047
s&p	4,005	431	4,436	62%	38%	68,476	2,916	64,684	785	68,385	72,464
1987 s ^b	59	372	431	4%	96%	25,271	531	21,615	105	22,251	34,080
p	4,186	73	4,259	99%	1%	43,409	2,749	40,285	393	43,427	46,908
s&p	4,245	445	4,690	64%	36%	68,680	3,280	61,900	498	65,678	80,988
1988 s	70	339	409	9%	91%	21,481	693	20,391	260	21,344	30,558
p	4,205	46	4,251	97%	3%	41,730	2,723	38,533	450	41,706	45,855
s&p	4,275	385	4,660	68%	32%	62,545	3,416	58,924	710	63,050	76,413
1989 s	78	308	386	8%	92%	27,732	745	26,835	65	27,645	29,216
p	4,447	137	4,584	94%	6%	56,544	2,160	53,505	825	56,490	58,941
s&p	4,525	445	4,970	66%	34%	84,156	2,905	80,340	890	84,135	88,157
1990 s	95	311	406	9%	91%	30,663	610	29,947	87	30,644	32,504
p	5,631	58	5,689	99%	1%	67,988	2,594	63,793	1,446	67,833	70,812
s&p	5,726	369	6,095	71%	29%	98,633	3,204	93,740	1,533	98,477	103,316
1991 s	293	418	711	16%	84%	37,761	1,217	36,289	213	37,719	41,159
p	6,222	NA	6,222	100%		82,767	3,947	75,499	3,264	82,710	85,059
s&p	6,515	418	6,933	74%	26%	120,528	5,164	111,788	3,477	120,429	126,218
1992 s	151	504	655	10%	90%	44,448	1,368	42,689	330	44,387	47,031
p	6,387	NA	6,387	100%		89,840	3,337	84,981	1,487	89,805	91,683
s&p	6,538	504	7,042	70%	30%	134,288	4,705	127,670	1,817	134,192	138,714
1993 s	14	759	773	1%	99%	50,044	1,308	48,582	70	49,960	54,762
p	7,914	NA	7,914	100%		93,747	2,729	89,629	1,358	93,716	97,767
s&p	7,928	759	8,687	65%	35%	143,791	4,037	138,211	1,428	143,676	152,529
1994 s	267	703	970	10%	90%	64,658	1,827	62,717	55	64,599	70,326
p	7,061	NA	7,061	100%		95,903	3,596	90,332	1,903	95,831	99,822
s&p	7,328	703	8,031	64%	36%	160,561	5,423	153,049	1,958	160,430	170,148
1995 s	191	665	856	7%	93%	51,517	1,762	48,903	821	51,486	55,290
p	6,760	NA	6,760	100%		85,997	4,568	76,670	4,726	85,964	88,617
s&p	6,951	667	7,616	65%	35%	137,104	6,330	125,573	5,547	137,450	143,907
1996 s	219	631	850	11%	89%	50,843	1,388	48,747	522	50,657	54,092
p	7,198	NA	7,198	100%		99,511	3,493	92,590	3,295	99,378	101,972
s&p	7,417	631	8,048	70%	30%	150,354	4,881	141,337	3,817	150,035	156,064
1997 s	286	847	1,133	10%	90%	80,961	2,439	78,188	177	80,804	85,578
p	9,086	NA	9,086	100%		151,387	5,336	145,881	155	151,372	154,467
s&p	9,372	847	10,219	69%	31%	231,517	7,775	224,069	332	232,176	240,045
1998 s	272	738	1,010	13%	87%	63,633	1,751	61,268	507	63,526	66,838
p	10,006	NA	10,006	100%		143,027	6,583	134,299	2,100	142,982	143,027
s&p	10,278	738	11,016	73%	27%	206,769	8,334	195,567	2,607	206,508	209,865
1999 s	336	766	1,104	12%	88%	76,633	3,058	72,901	292	76,251	80,947
p	9,943	NA	9,943	100%		145,612	5,755	137,729	2,095	145,579	149,877
s&p	10,279	766	11,047	70%	30%	222,245	8,813	210,630	2,387	221,830	230,824

^a Includes all reported species

s = subsistence

p = personal use

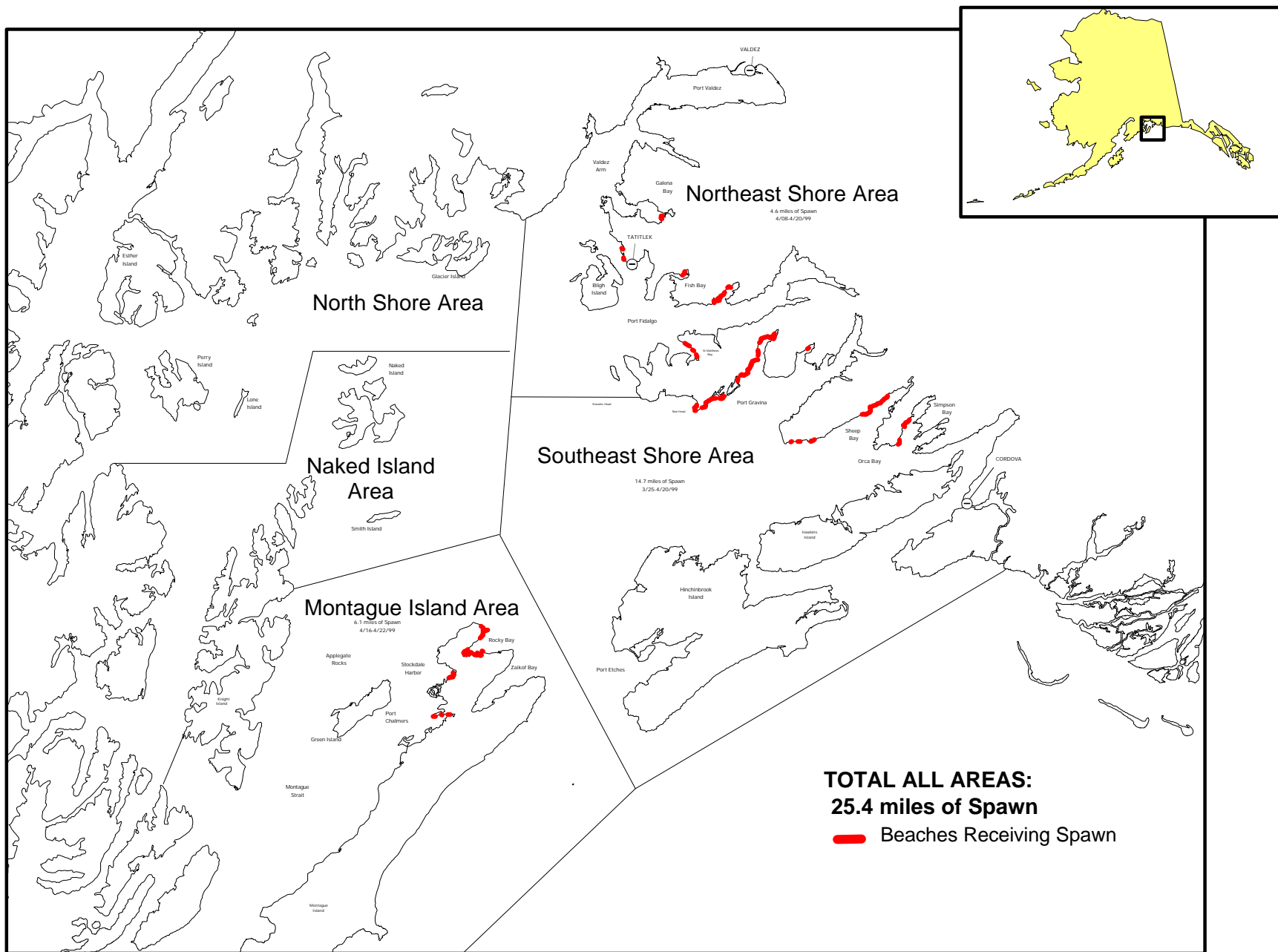
^b Subsistence dip net catch estimated

s&p = total catch

Appendix G.6. Personal use salmon harvest by district, species and gear type,
Prince William Sound Management Area, 1999.

Gear								
District	Permits	Landings	Type	Chinook ^a	Sockeye	Coho	Pink	Chum
Bering River	2	2	Drift Gillnet	2	102	0	0	0
Copper River	297	629	Drift Gillnet	1,115	1,333	36	1	68
Coghill	5	6	Drift Gillnet	5	8	0	0	0
Southwestern	1	1	Purse Seine	0	18	13	0	0
Unakwik	1	1	Drift Gillnet	0	35	0	0	0
Total	306	639		1,122	1,496	49	1	68

^a In 1994 the BOF passed regulation 5 AAC 24.356 requiring all chinook salmon taken in the Copper River and Bering River Districts, but not sold, be reported on fish tickets.



Appendix H.1. Location of spawning herring and miles of spawn observed during aerial surveys in Prince William Sound, Alaska, 1999.

Appendix H.2. Prince William Sound commercial Pacific herring harvest summary with fishing location and effort by gear type, 1999.

Fishery	Fishing Information				Harvest and Use (tons)	
	Area	Date	Duration	Effort	Spawn-on-kelp	Pacific Herring
Sac Roe Purse Seine	NO OPENINGS					
	Total				0.0	
Sac Roe Gillnet	NO OPENINGS					
	Total				0.0	
Wild spawn-on-kelp	NO OPENINGS					
	Total ^a				0.0	
Pound spawn-on-kelp	St Matthews Bay	4/21		7	5.5	
	Montague Island	4/01		2	0.6	
	Total ^c				6.2	48.8 ^d
Food/Bait Fishery	NO OPENINGS					
	Total				0.0	
<u>Harvest and Use - Total</u>					48.8	

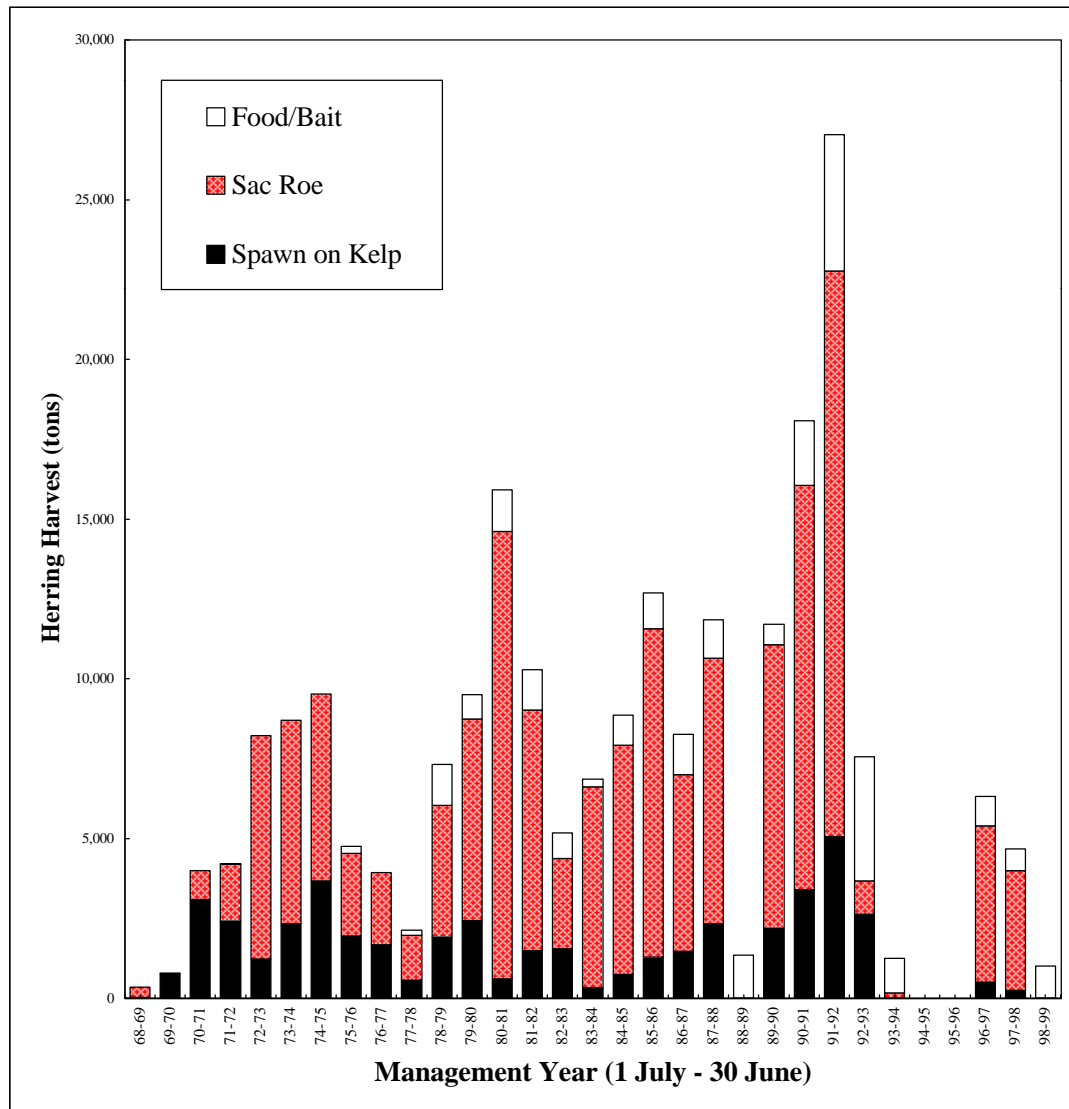
^a The harvest of naturally occurring herring spawn on native kelp in Prince William Sound.

^b The biomass of herring subjected to removal of reproductive capacity of the population based on the assumptions that 10% of the biomass of pre-spawning herring consists of eggs and that 80% of the weight of harvested spawn on kelp consists of eggs.

^c The harvest of herring spawn on kelp produced in net pens or pounds.

^d The biomass of herring subjected to stress mortality and removal of reproductive capacity of the population based on the assumption that 12.5 tons of herring are used to produce one ton of spawn on kelp.

All Fisheries Herring Harvest Prince William Sound



Appendix H.3. Prince William Sound commercial herring harvest by management year and fishery, 1968-1999.

Appendix H.4. Pacific herring sac roe seine and gillnet fishery effort, anticipated harvest, and actual harvest, Prince William Sound, 1969-1999.

Calendar Year	Seine Fishery							Gillnet Fishery							Total Harvest (tons)
	Opening Dates	Hours	Effort (Boats)	Guideline Harvest ^a	Harvest (tons)	CPUE (tons/Boat Hr)	Estimated Roe %	Opening Dates	Hours	Effort (Boats)	Guideline Harvest ^a	Harvest (tons)	CPUE (tons/Boat Hr)	Estimated Roe %	
1969	3/01 - 6/30		5		325.4										325.4
1970	3/01 - 6/30														
1971	3/01 - 6/30		12		919.2										919.2
1972	3/01 - 6/30		18		1,777.2										1,777.2
1973	4/23 - 5/09		31		6,991.9										6,991.9
1974	4/10 - 4/17		72		6,371.0			4/10 - 4/17		3		3.8			6,374.8
1975	4/15 - 4/22	14.0	76		5,853.8	5.50			14.0						5,853.8
1976	5/08 & 6/01	13.0	66		2,584.2	3.01			13.0						2,584.2
1977	4/09 - 4/10	38.0	58		2,265.6	1.03		4/09 - 04/10	38.0	1		1.6	0.04		2,267.1
1978	4/17 - 4/21 ^b	106.0	75	5,000	1,329.5	0.17		4/17 - 04/21	106.0	38		61.7	0.02		1,391.2
1979	4/07 - 4/19	215.5	89	5,000	4,138.0	0.22		CLOSED ^c							4,138.0
1980	4/01 - 4/09	162.0	76	5,000	6,042.2	0.49		4/17 - 5/05		16		264.4			6,306.7
1981	4/01 - 4/09	60.0	106	5,000	13,768.2	2.16		4/16 - 4/18	53.0	18		234.5	0.25		14,002.8
1982	4/23	2.0	95	5,000	7,148.3	37.62	10-14%	4/24 - 4/26	54.0	18		393.9	0.41	12-15%	7,542.2
1983	4/13	1.0	103 ^d	5,000	2,728.5	26.49	11.0%	4/21 - 4/22	24.0	22		105.4	0.20	11.0%	2,833.9
1984	4/14	3.0	105 ^e	5,000	5,946.1	18.88	10-11%	4/18 - 4/22	59.0	23	250	342.7	0.25	8-14%	6,288.8
1985	4/28 - 4/29	4.0	103 ^f	5,000	6,764.1	16.42	10-12%	4/29 - 5/01	34.0	21	250	413.3	0.58	10-12%	7,177.4
1986	4/17	3.0	106	5-7,000	9,828.1	30.91	11.0%	4/24 - 4/28	90.0	24	3-400	448.6	0.21	11.4%	10,276.7
1987	4/08 - 4/09	1.5	96	3-5,000	4,982.2	34.60	10.0%	4/10 - 4/11	24.0	24	2-300	533.3	0.93	9.5%	5,515.5
1988	4/21 - 4/22	2.0	105	4-5,000	7,977.3	37.99	10.5%	4/23	5.5	24	275	353.0	2.67	10.0%	8,330.3
1989	Season Closed ^g			6,400							375				0.0
1990	4/12	0.3	96	6,038	8,362.1	290.35	10.0%	4/13	4.0	24	353	505.4	5.26	10.6%	8,867.5
1991	4/09, 4/10, & 4/19	1.3	104	11,233	11,923.0 ^h	85.32	10.5%	4/18	10.5	24	657	742.0	2.94	11.06%	12,665.1
1992	4/13, 4/17, & 4/21	2.0	104	14,100	16,784.2 ⁱ	80.69	10.0%	4/23 - 4/24	11.0	24	825	940.6	3.56	10.8%	17,724.8
1993	No Harvest			15,586				4/15, 4/17-4/19	36.0	24	912	1,029.9	1.19	11.01%	1,029.9
1994	Season Closed ^j			0	151.0 ^k						0				151.0
1995	Season Closed ^j			0							0				0.0
1996	Season Closed ^j			0							0				0.0
1997	4/13,4/15	1.8	71	2,965	4,703.5	36.80	9.75%	4/09	2.5	22	175	175.7	3.19	8.00%	4,879.2
1998	4/06	0.5	46	3,367	3,329.7	144.77	9.6%	4/11, 4/12	6.5	20	197	415.1	3.19	11.0%	3,744.8
1999	Season Closed ^j			3,447							202				0.0

^a Guideline harvest based on pre-season harvest projection beginning in 1986.

^b An additional opening on 6/14 for 6 hours resulted in no harvest.

^c Gillnet fishery closed by Board of Fisheries action.

^d Of 103 boats participating, 72 actually made deliveries.

^e Of 105 boats participating, 101 actually made deliveries.

^f Of 103 boats participating, 62 made deliveries at Montague Island and 90 made deliveries in the north-shore area.

^g All Pacific herring commercial sac roe and spawn-on-kelp fisheries in Prince William Sound were closed during the spring of 1989 due to the potential for contamination of catches from the T/V Exxon Valdez oil spill.

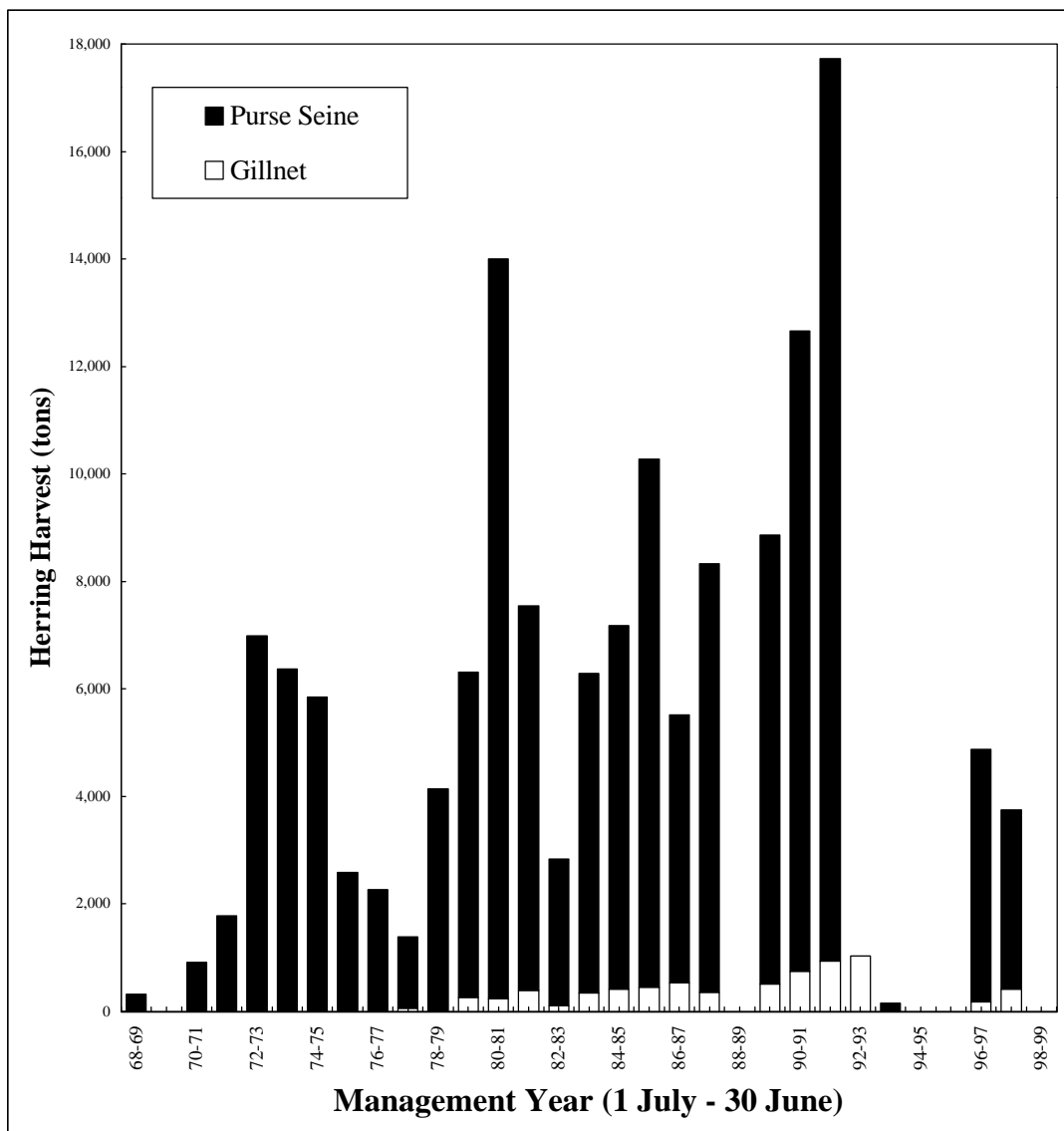
^h Total for 1991 includes a 92.2 ton test fishing set made by ADF&G for aerial survey calibration.

ⁱ Total for 1992 includes a 192.5 ton test fishing catch made by ADF&G for aerial survey calibration.

^j Season closed due to low herring abundance.

^k Harvest for 1994 consisted of a single test fishing catch made by ADF&G for aerial survey calibration.

Sac Roe Herring Harvest by Fishery Prince William Sound



Appendix H.5. Prince William Sound commercial herring sac roe purse seine and gillnet harvest by management year, 1968-1999.

Appendix H.6. Pacific herring spawn-on-kelp harvests from natural spawning, Prince William Sound, 1969 - 1999.

Calendar Year	Fishery Dates	Hours	Effort (Divers)	Guideline Harvest (tons)	Harvest by Kelp Species and Grounds Price (\$/lb)								Spawn-on-Kelp Harvest		Herring Utilized ^a (tons)
					Ribbon		Sieve		Fucus		Other				
					Percent	Price	Percent	Price	Percent	Price	Percent	Price	(lb)	(tons)	
1969	5/18-5/31		3										5,424	2.7	21.7
1970	4/19-6/06		34										190,374	95.2	761.5
1971	4/18-5/15		159										769,481	384.7	3,077.9
1972	4/30-5/20		397										600,453	300.2	2,401.8
1973	4/23-5/26		176										306,358	153.2	1,225.4
1974	4/22-5/04		143		Mostly Ribbon - Some Sieve and Hair				\$0.60-0.75				580,588	290.3	2,322.4
1975	4/25-5/10		328										916,919	458.5	3,667.7
1976	4/21- ?		279										485,043	242.5	1,940.2
1977	4/27-12/31		104										417,000	208.5	1,668.0
1978	4/20-4/30		66	165	23%		50%				27% ^b		141,268	70.6	565.1
1979	4/25-5/03		97	200									474,242	237.1	1,897.0
1980	4/23-4/30	10	458	200	60%	\$1.25	40%	\$0.85					603,880	301.9	2,415.5
1981	4/25	12	196	200	38%	\$1.25	60%	\$0.85			2% ^b	\$0.60	122,532	61.3	490.1
1982	5/05-5/08	73	152	187	83%	\$1.42	11%	\$0.95			6% ^b	\$0.74	291,430	145.7	1,165.7
1983	4/27	12	185	187	51%	\$2.00-2.45	35%	\$1.50-1.70			14% ^c		298,362	149.2	1,193.4
1984	Season Closed ^d		225 ^e	187											
1985	5/06 & 5/08	20	106	169	51%	\$1.25	49%	\$0.50					60,832	30.4	243.3
1986	4/30-5/03	86	29	142	97%	\$1.75		\$0.80			^b	\$0.80	95,205	47.6	380.8
1987	4/15-4/17	44	59	103	90%	\$1.70		\$0.85			^b	\$0.80	176,485	88.2	705.9
1988	4/29 & 4/30	12	159	103	64%	\$1.50	24%	\$0.75-1.00			12% ^b	\$0.75-1.00	194,762	97.4	779.0
1989	Season Closed ^f			110											
1990	4/21-4/22	16	134	104	37%	\$0.99	6%	\$0.52			57% ^b	\$0.88	237,575	118.8	950.3
1991	5/11-5/17	95	48	195					100%	\$0.75-0.85			215,147	107.6	860.8
1992	4/24-4/30	101	217	243	21%	\$0.70			76%	\$0.40	3%		504,663	252.3	2,018.7
1993	4/19-4/24	114	83	268					100%	\$0.55			325,181	162.6	1,300.7
1994	Season Closed ^g			110											
1995	Season Closed ^g			0											
1996	Season Closed ^g			0											
1997	4/25 & 4/26	26.4	45	56.4					100%				52,800	26.4	211.2
1998	4/22-4/27	62	35	464	16%	\$0.80			84%	\$0.50			34,695	17.3	138.8
1999	Season Closed ^g			475											

^a Indicates the annual removal of reproductive capacity from the population based on the assumption that average fish roe recovery is 10%, and 80% of spawn-on-kelp harvest weight consists of eggs.

^b Hair kelp.

^c Mostly *Macrocystis* spp. Some hair kelp.

^d Season remained closed due to lack of suitable spawn.

^e Permits issued.

^f All Pacific herring commercial sac roe and spawn-on-kelp fisheries in Prince William Sound were closed during the spring of 1989 due to the potential for contamination of catches from the *T/V Exxon Valdez* oil spill.

^g Season remained closed due to low herring abundance.

Appendix H.7. Pacific herring spawn-on-kelp harvest produced in pounds, Prince William Sound, 1979 - 1999.

Calendar Year	Fishery Dates ^c	Effort				Guideline Harvest (tons)	Blades per Permit Holder		Spawn-on-Kelp Harvest (tons)			Herring Utilized ^b (tons)
		CFEC Permits ^d	Permits Committed ^e	Producing Permits ^a			Closed ^f	Open ^g	Ribbon	Macrocystis	Total	
				Closed ^f	Open ^g							
1979		2	0									
1980	4/14	14	4	2		8			0.9	0.4	1.3	16.6
1981	4/14	18	18	7		16			8.6	1.1	9.7	120.7
1982	4/29-5/10	25	20	18		26			25.1	0.5	25.5	319.2
1983	4/30-5/04	47	38	26		26			17.7	10.1	27.7	346.7
1984	4/24-5/08	65	45	37		26			6.4	18.8	25.2	315.1
1985	4/25-5/07	81	59	50		40			12.1	28.1	40.2	502.1
1986	4/21-4/28	104	82	81		60			0	72.2	72.2	903.0
1987	4/10-4/21	111	111	108		85			0	61.2	61.2	765.1
1988	4/12-4/23	122	122	119		85			0	123.2	123.2	1,540.5
1989	Season Closed ^h											
1990	4/11-4/26	128	128	122		118			0	98.8	98.8	1,235.3
1991	4/07-4/20	126	126	119		220	1,200		0	202.4	202.4	2,530.5
1992	4/07-4/24	127	127	127		276	1,770		0	242.2	242.2	3,027.7
1993	4/10-4/22	128	124	52		305	1,950		0	106.4	106.4	1,330.5
1994	Season Closed ⁱ											
1995	Season Closed ⁱ											
1996	Season Closed ⁱ											
1997	4/10-5/6	128	116	7	84	725	410	640	0	34.3	34.3	290.5
1998	j	128	36	13	20	823	425	660	0	10.7	10.7	104.3
1999	k	128	27	7	2	843	435	680	0	6.2	6.2	48.8

^a Number of permits that were successful in producing spawn-on-kelp product. Due to the group cooperation in this fishery production is frequently reported for a few individuals whose pounds did not produce spawn-on-kelp product.

^b The equivalent harvest of Pacific herring due to stress mortality and the removal of reproductive capacity from the population based on the assumption that 12.5 tons of Pacific herring are used to produce 1 ton of spawn-on-kelp product.

^c Dates that the fishery was opened to seines for the capture and placement of Pacific herring into pounds.

^d Prior to 1994, Commssioner's permits issued to applicants registering prior to the March 1 deadline. After 1994, the number of permits represents limited entry permits. Beginning in 1997, permit holders were allowed to operate pounds in open or closed configuration, and required to state intended configuration prior to season.

^e The number of individuals receiving an equal allocation of the guideline harvest. Prior to 1994 this represents the number of individual pounds constructed by the April 1 deadline. Beginning in 1997, this number represents permit holders stating intended configuration prior to season.

^f A pound fished in a closed configuration consists of a rectangular floating frame with webbing suspended below, that encloses herring and kelp for period of time during spawning.

^g A pound fished in an open configuration consists of a rectangular floating frame with either no webbing suspended below, or with webbing that permits volitional entry and exit of herring on at least one side.

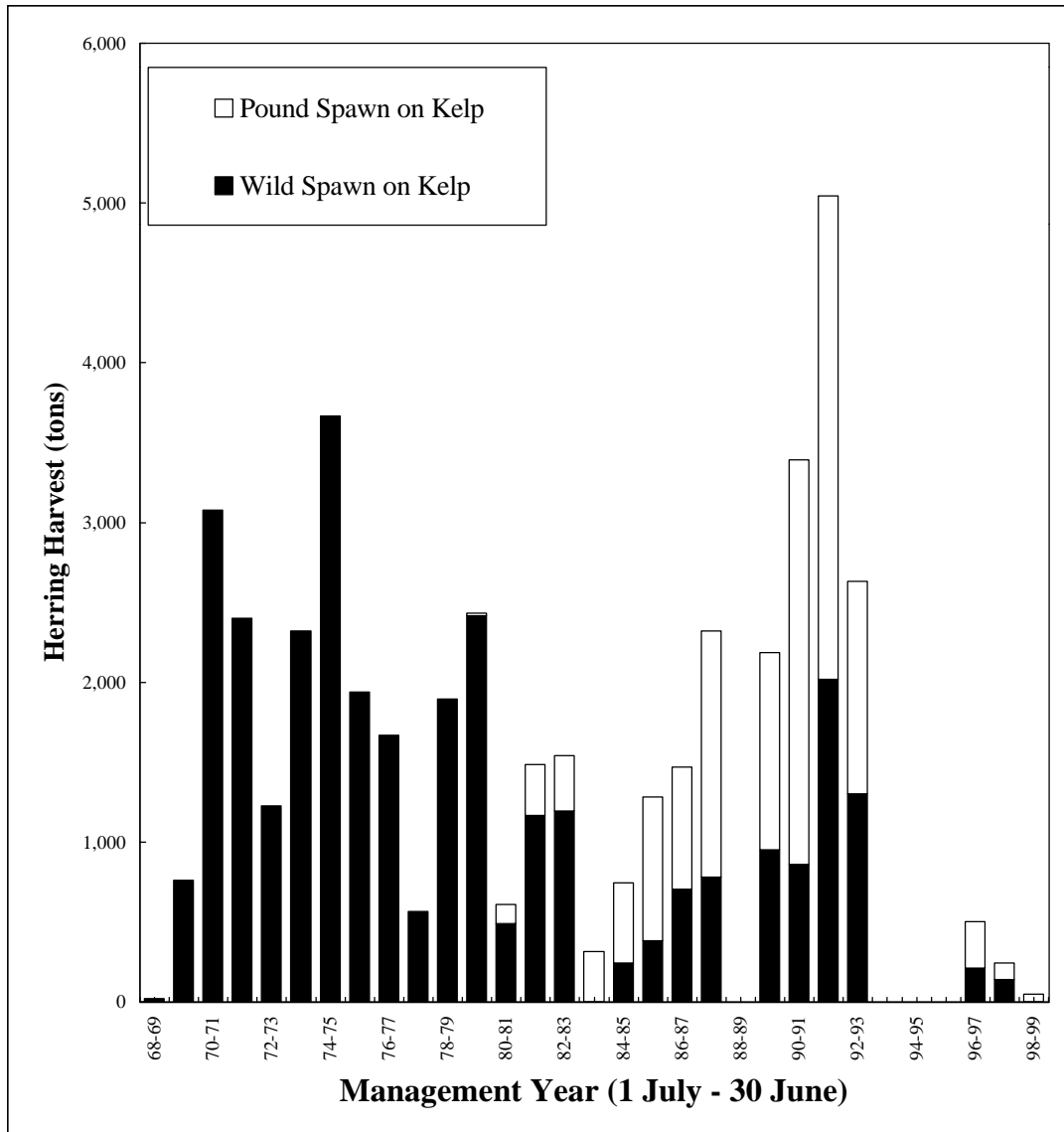
^h All Pacific herring commercial sac roe and spawn-on-kelp fisheries in Prince William Sound were closed during the spring of 1989 due to the potential for contamination of catches from the *T/V Exxon Valdez* oil spill.

ⁱ Season closed due to low herring abundance.

^j Opening dates for each area were: Montague Island 4/04, Eastern 4/05, Northern 4/09, and Southeastern 4/13. All areas closed by regulation on 12/31/98.

^k Opening dates for each area were: Montague Island 04/01, St. Matthews Bay 04/20. All areas closed by emergency order on 04/25/99.

Spawn on Kelp Herring Usage Prince William Sound



Appendix H.8. Prince William Sound commercial spawn-on-kelp herring usage by management year, 1968-1999.

Appendix H.9. Prince William Sound commercial Pacific herring food/bait fishery effort and harvests, management years 1969-1999.

Harvest Management Year	Fishing Dates		Guideline Harvest	Purse Seine		Pair Trawl		Mid-Water Trawl		Otter Trawl		Total Harvest (tons)
				Effort (Boats)	Harvest (tons)	Effort (Boats)	Harvest (tons)	Effort (Boats)	Harvest (tons)	Effort (Boats)	Harvest (tons)	
	Opened	Closed										
1969-1970	10/01/69	- 06/30/70 ^a		-	14.0							14.0
1970-1971	10/01/70	- 06/30/71 ^a										0.0
1971-1972	10/01/71	- 06/30/72 ^a		-	20.0							20.0
1972-1973	10/01/72	- 05/09/73 ^a		-	9.0							9.0
1973-1974	08/27/73	- 04/17/74 ^a	^b	-	8.5							8.5
1974-1975	07/15/74	- 03/10/75	^b									0.0
1975-1976	06/01/75	- 06/25/75 ^c	^b	4	226.7							226.7
1976-1977	02/01/77	- 03/09/77	^b									0.0
1977-1978	10/01/77	- 02/28/78	^b	-	17.0	-	145.3					162.3
1978-1979	10/16/78	- ? ^d	^b	-	195.4	7	988.7	-	9.4	-	81.0	1,274.4
1979-1980	09/16/79	- 02/28/80 ^e	1,400	-	510.8	4	145.1	-	103.2	-	2.6	761.7
1980-1981	09/15/80	- 11/07/80	1,400	-	1,030.4	6	275.7					1,306.1
1980-1982	09/15/81	- 09/30/81	1,400	7	1,189.4	-	73.1					1,262.5
1982-1983	09/15/82	- 01/31/83	1,400	6	797.3							797.3
1983-1984	09/15/83	- 01/31/84	1,400	-	257.6							257.6
1984-1985	09/15/84	- 01/31/85	1,400	-	936.2							936.2
1985-1986	09/01/85	- 02/15/86	1,400	6	1,118.1							1,118.1
1986-1987	09/01/86	- 10/24/86	1,400	6	1,276.2							1,276.2
1987-1988	09/02/87	- 11/12/87 ^f	1,400	7	1,189.4							1,189.4
1988-1989	11/01/88	- 11/05/88	1,400	8	1,335.3							1,335.3
1989-1990	11/01/89	- 01/31/90	1,694	-	646.1							646.1
1990-1991	09/21/90	- 11/24/90 ^g	3,151	5	1,955.0			-	60.8			2,015.9
1991-1992	10/01/91	- 10/14/91	3,956	14	4,258.5							4,258.5
1992-1993	10/01/92	- 10/22/92	3,416 ^h	17	3,900.3							3,900.3
1993-1994	10/07/93	- 10/10/93	978 ⁱ	8	1,087.0							1,087.0
1994-1995	Season Closed ^j											0.0
1995-1996	Season Closed ^j											0.0
1996-1997	11/01/96	- 11/03/96	825	6	933.9							933.9
1997-1998 ^k	11/1/97,2/19/98	- 02/28/98	945	12	679.7							679.7
1998-1999	11/02/98	- 11/04/98, 11/06/98	967	11 ^l	1,003.3	-	-					1,003.3
1999-2000	Season Closed ^j											0.0

^a Openings set by regulation. Ending date coincides with regulatory ending of sac roe season.

^b No Official quota, but unofficial goal was 1,500 tons.

^c Harvest from special June food-and-bait fishery opening. Although this harvest actually occurred at the end of the 1975 management year, it is included in the 1976 harvest management year to be consistent with other food-and-bait harvests which occur after spring sac roe fisheries.

^d Fishery closed from 1 January to 6 January 1979.

^e Fishery closed from 1 January to 15 February 1980.

^f Fishing season opened by regulation on September 1, 1987 in the General District. The north-shore and east-shore Pacific herring districts opened on September 23. The season was closed by emergency order on October 6 for a period of five weeks, reopened on November 9, and closed for the duration of the 1987-88 season on November 12, 1987.

^g Fishery open from September 21 until November 24. The Montague Island area was open from September 24 until November 24.

^h Preseason guideline harvest level based on spawn deposition biomass estimate. Final guideline harvest based on age-structured analysis was issued in January 1993 and was 4,373 tons.

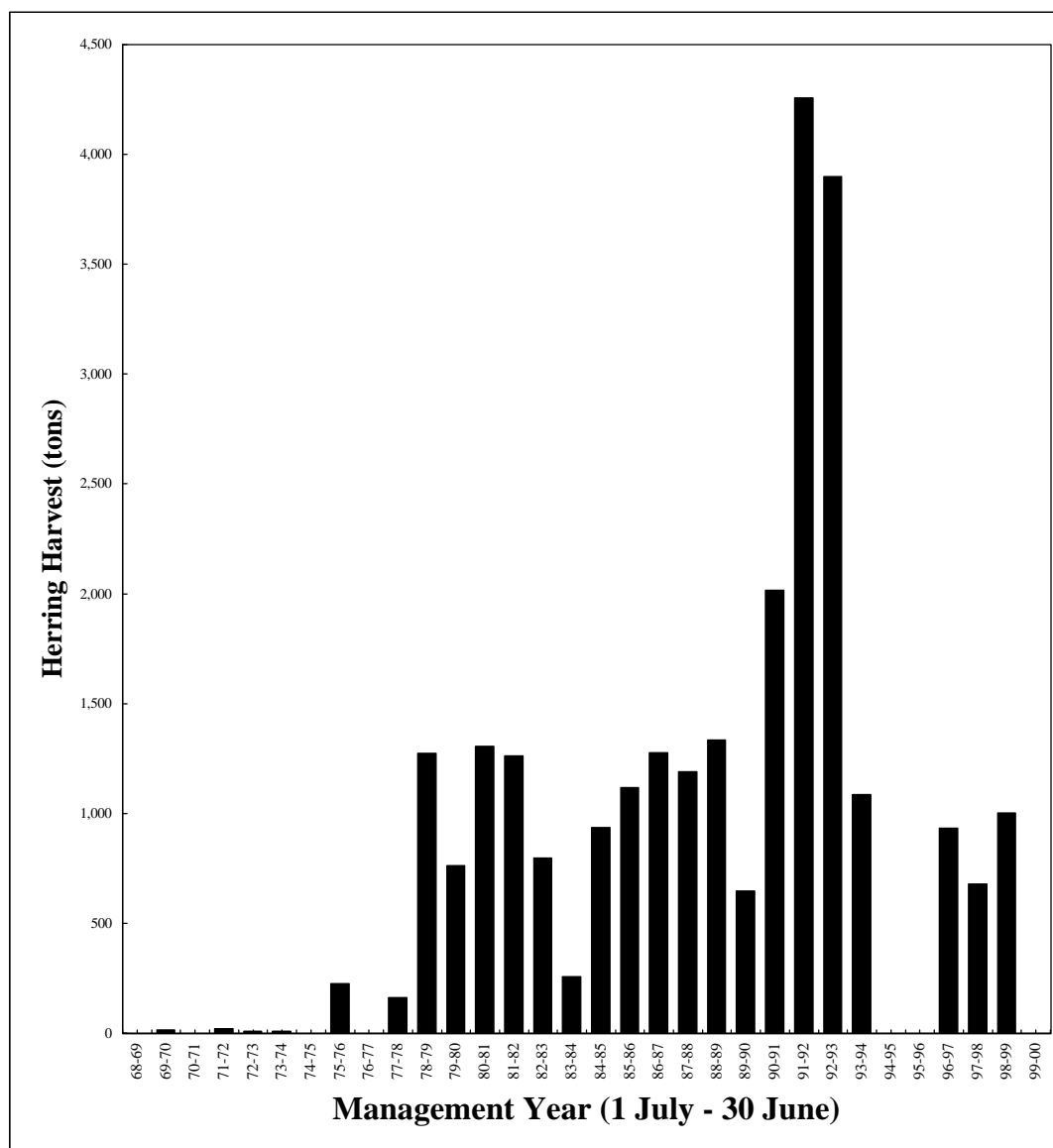
ⁱ Preseason guideline harvest level based on preliminary aerial survey biomass estimate of 40,000 tons.

^j Season closed due to low herring abundance.

^k Season reopened in spring 1998 based on final age structured assessment modelling. Of the total harvest, 578.1 tons were taken in November 1997 and 101.6 tons were taken in February 1998.

^l Includes sale from ADF&G test fishing near Knowles Head, 31 October 1998.

Food/Bait Herring Harvest Prince William Sound



Appendix H.10. Prince William Sound commercial food/bait herring harvest, management years 1968-1999.

Appendix H.11. Annual Pacific herring biomass indices for harvest management years 1973-1999 and the forecast of prefishery run biomass for 2000, Prince William Sound.

Harvest Management Year	Total Spring Use and Harvest Mortality ^a (tons)	Aerial Survey Estimates				Unexploited Escapement Biomass		Pre-Fishery Run Biomass	Observed Peak Acoustic Biomass Estimates		Prior Year Forecast (tons)
		Peak Biomass Estimate ^b (tons)	Maximum Possible Observed Biomass ^c	Miles of Spawn ^d	Mile Days of Spawn ^e	Spawn Deposition Surveys ^f (tons)	Age Structured Analysis ^g (tons)	Age Structured Analysis ^g (tons)	Observed Peak Acoustic Biomass Estimates		
									Fall (tons)	Spring (tons)	
1973-1974	6,375	41,080	107,290	38.5	75.2						
1974-1975	5,854			34.2	42.4						
1975-1976	2,584	7,330	25,247	32.8	33.7						
1976-1977	2,267	16,830	17,460	39.3	73.5						
1977-1978	1,391	13,410	36,540	28.7	36.3						
1978-1979	4,138	42,100	107,390	54.5	73.2						
1979-1980	6,323	62,110	122,050	50.5	73.9		58,221	63,290			
1980-1981	14,124	77,810	161,690	85.4	140.1		63,494	76,890			
1981-1982	7,861	68,790	97,620	49.0	65.1		56,823	64,366			
1982-1983	3,181	41,850	107,710	67.4	99.8	22,000 ^h	65,949	68,753			
1983-1984	6,604	58,870	158,760	60.1	86.8	58,089	77,021	83,037			
1984-1985	7,679	20,830	60,954	101.2	149.5		96,694	104,034			
1985-1986	11,180	15,180	54,820	72.4	152.3		74,740	85,543			
1986-1987	6,281	26,530	52,192	65.3	155.9		71,773	76,891			
1987-1988	9,871	34,270	67,175	166.3	236.9	53,785	123,346	132,633			43,992
1988-1989	ⁱ	56,915	186,708	98.4	185.8	49,914	119,237	119,237			54,899
1989-1990	10,103	57,900	145,013	94.1	144.4	127,478	89,613	99,783			51,692
1990-1991	15,196	42,765	141,375	58.0	64.8	140,964	64,836	78,985			96,666
1991-1992	20,752	53,835	130,569	74.7	99.5	128,263	77,598	96,860			121,342
1992-1993	2,360	20,725	109,865	20.4	40.8		22,735	24,873			134,133
1993-1994	151	19,640	154,008	14.6	20.0	17,069	16,559	16,559	20,998		29,787
1994-1995	0	7,113	20,868	20.4	32.3	20,022	18,104	18,104	13,840	14,643	19,009
1995-1996	0	10,691	37,771	27.2	39.1	27,670	27,909	27,909	26,776	25,353	24,332
1996-1997	5,170	10,858	57,114	42.7	56.0	23,171	33,387	37,925	3,086	44,095	37,599
1997-1998	3,849	13,817	50,124	38.7	48.5		34,726	38,389		25,045	38,640
1998-1999	49	6,366		25.4	37.8		28,310	28,362		23,802	39,557
1999-2000	0			19.5	24.6			23,987			

^a Represents the common property seine and gillnet sac roe harvest, and equivalent use of herring in closed pound SOK fisheries.

^b Largest single day aerial estimate of Pacific herring biomass in short tons.

^c The sum of all daily aerial biomass estimates for a given year.

^d Total linear miles of spawn.

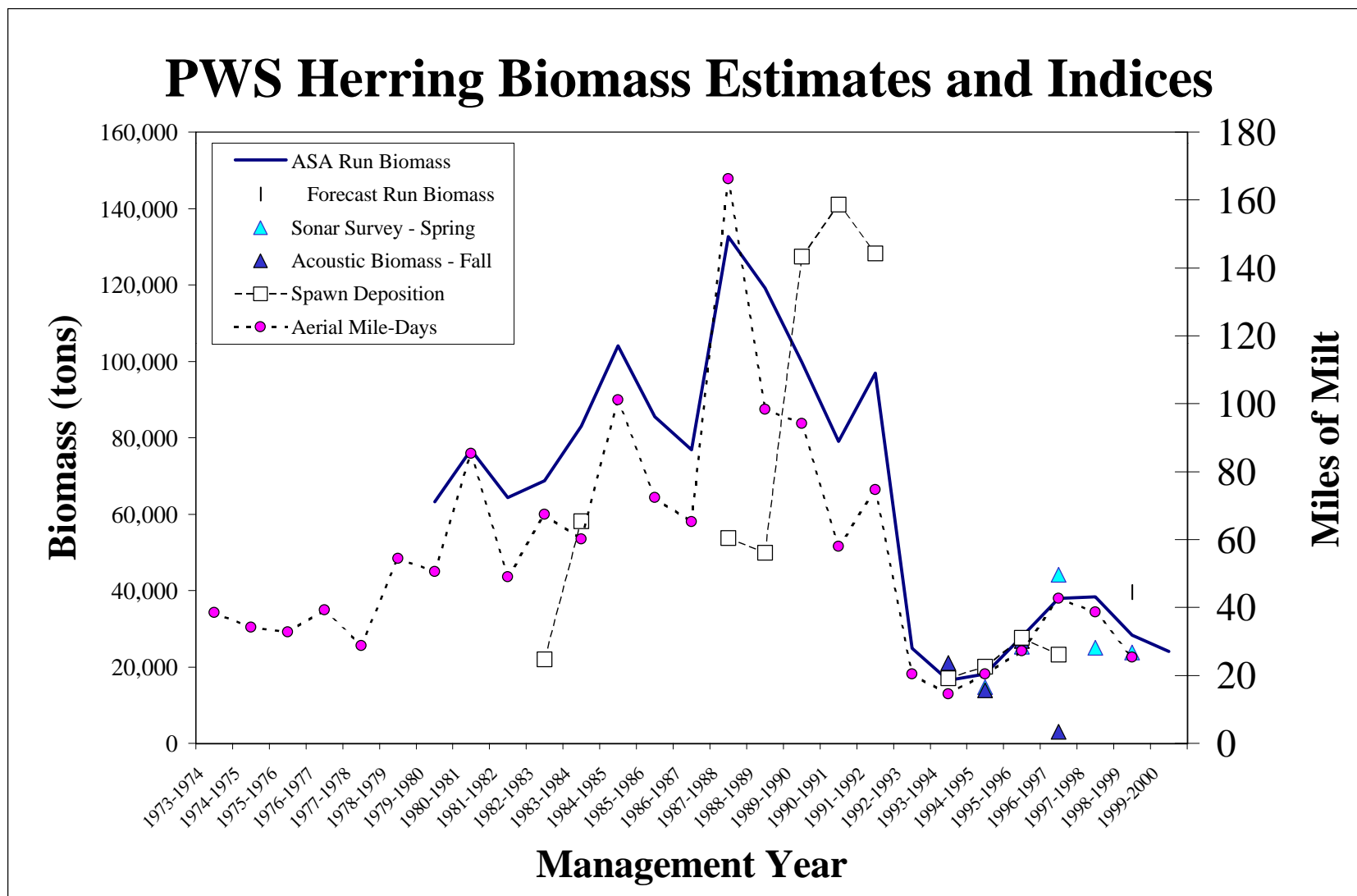
^e The sum of the daily observed linear miles of Pacific herring spawn.

^f Estimates are made from underwater surveys of spawn deposition.

^g Unexploited escapement and run biomass estimates from age structured analysis, February 1998.

^h Partial estimate of spawning biomass from feasibility study.

ⁱ All Pacific herring commercial sac roe and spawn-on-kelp fisheries in Prince William Sound were closed during the spring of 1989 due to the potential for contamination of catches from the *T/V Exxon Valdez* oil spill.



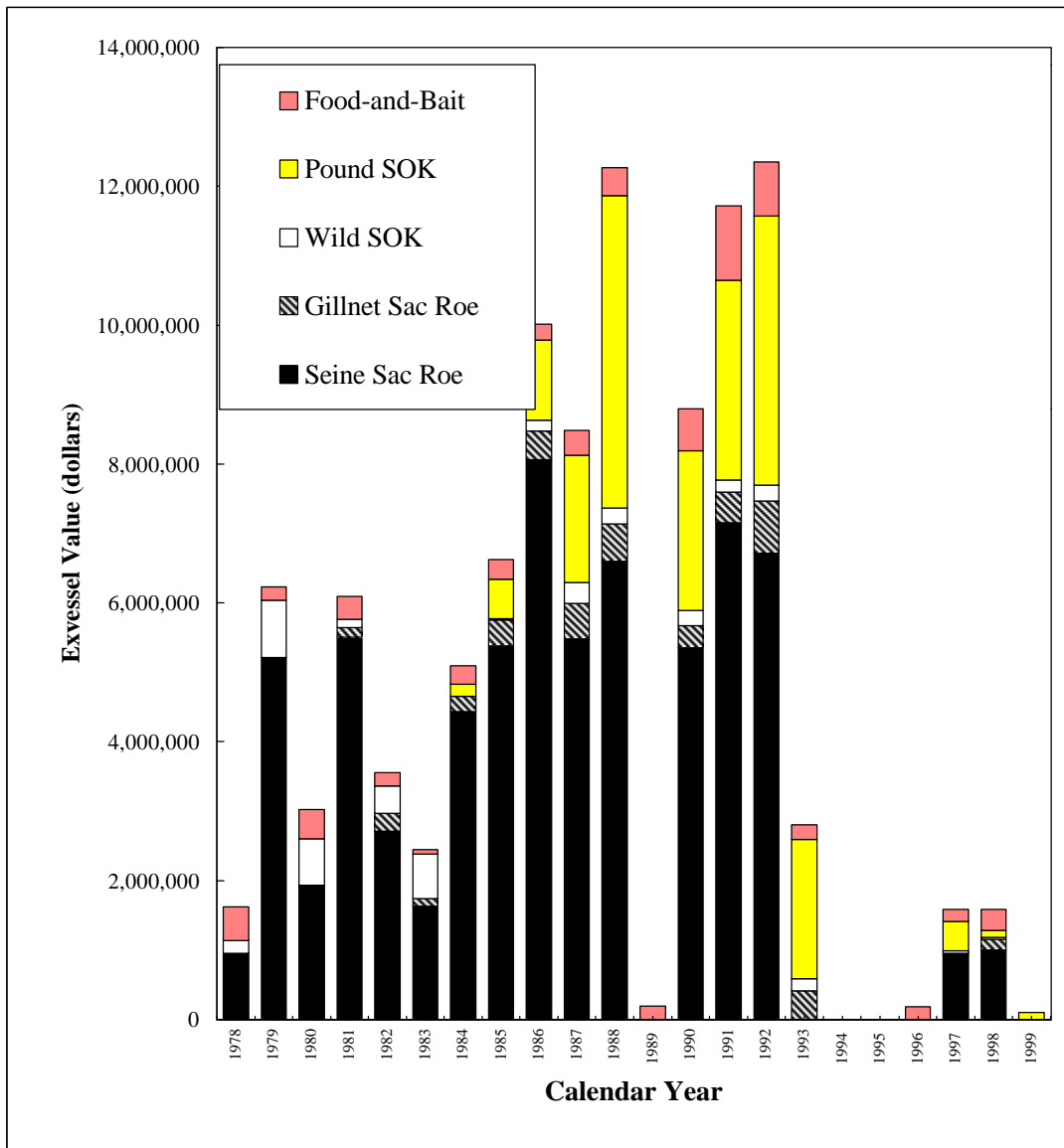
Appendix H.12. Prince William Sound annual herring biomass indices by management year, 1973-1999, and forecast run biomass for 2000 from ASA modeling.

Appendix H.13. Mean price and estimated exvessel value of the commercial Pacific herring harvest by gear type based on verbal post season estimates from processors and permit holders, Prince William Sound, calendar years 1978-1999.

Calendar Year	Sac Roe Fisheries				Spawn on Kelp Fisheries				Food-and-Bait Fishery		
	Purse Seine		Gillnet		Wild Spawn on Kelp		Pounds		Mixed Gear		
	Price per ton	Total Value	Price per ton	Total Value	Price per lb	Total Value	Price per lb ^a	Total Value	Price per ton	Total Value	TOTAL VALUE
1978	\$ 720	\$ 956,800			\$ 1.25	\$ 175,000			\$ 380	\$ 489,820	\$ 1,621,700
1979	\$ 1,260	\$ 5,213,880			\$ 1.74	\$ 821,280			\$ 300	\$ 196,800	\$ 6,231,960
1980	\$ 320	\$ 1,933,760			\$ 1.09	\$ 667,080			\$ 300	\$ 424,800	\$ 3,025,640
1981	\$ 400	\$ 5,508,000	\$ 580	\$ 135,720	\$ 1.00	\$ 122,000			\$ 260	\$ 328,120	\$ 6,093,840
1982	\$ 380	\$ 2,716,240	\$ 640	\$ 251,520	\$ 1.29	\$ 397,320			\$ 220	\$ 194,260	\$ 3,559,340
1983	\$ 600	\$ 1,634,400	\$ 1,040	\$ 109,200	\$ 2.10	\$ 634,200			\$ 260	\$ 70,980	\$ 2,448,780
1984	\$ 760	\$ 4,435,360	\$ 640	\$ 218,880	NO HARVEST		\$ 3.50	\$ 176,439	\$ 260	\$ 265,460	\$ 5,096,139
1985	\$ 760	\$ 5,380,800	\$ 900	\$ 371,700	\$ 0.48	\$ 19,200	\$ 7.09	\$ 569,058	\$ 250	\$ 279,500	\$ 6,620,258
1986	\$ 820	\$ 8,058,960	\$ 920	\$ 412,160	\$ 1.70	\$ 159,800	\$ 8.00	\$ 1,155,200	\$ 180	\$ 229,680	\$ 10,015,800
1987	\$ 1,100	\$ 5,480,200	\$ 960	\$ 511,680	\$ 1.70	\$ 299,200	\$ 15.00	\$ 1,836,000	\$ 300	\$ 356,700	\$ 8,483,780
1988	\$ 840	\$ 6,600,000	\$ 1,400	\$ 537,000	\$ 1.20	\$ 232,000	\$ 18.00	\$ 4,500,000	\$ 300	\$ 400,590	\$ 12,236,500
1989	SEASON CLOSED								\$ 300	\$ 193,830	\$ 193,830
1990	\$ 640	\$ 5,351,744	\$ 640	\$ 323,456	\$ 0.90	\$ 213,840	\$ 11.40	\$ 2,305,080	\$ 300	\$ 605,130	\$ 8,799,250
1991	\$600	\$ 7,153,800	\$ 600	\$ 445,200	\$ 0.80	\$ 172,160	\$ 9.00	\$ 2,880,000	\$ 250	\$ 1,064,625	\$ 11,715,785
1992	\$ 400	\$ 6,713,680	\$ 800	\$ 752,480	\$ 0.46	\$ 232,116	\$ 8.00	\$ 3,875,200	\$ 200	\$ 780,060	\$ 12,353,536
1993	NO HARVEST		\$ 400	\$ 411,960	\$ 0.55	\$ 178,860	\$ 10.00	\$ 2,000,000	\$ 200	\$ 217,400	\$ 2,808,220
1994	SEASON CLOSED								SEASON CLOSED		
1995	SEASON CLOSED								SEASON CLOSED		
1996	SEASON CLOSED								\$ 200	\$ 187,000	\$ 187,000
1997	\$ 200	\$ 940,600	\$ 80	\$ 14,080	\$ 0.61	\$ 32,000	\$ 8.00	\$ 426,816	\$ 250	\$ 170,000	\$ 1,583,496
1998	\$ 300	\$ 999,000	\$ 375	\$ 156,000	\$ 0.65	\$ 23,000	\$ 5.00	\$ 107,000	\$ 295	\$ 296,000	\$ 1,581,000
1999	SEASON CLOSED						\$ 8.00	\$ 99,000	SEASON CLOSED		

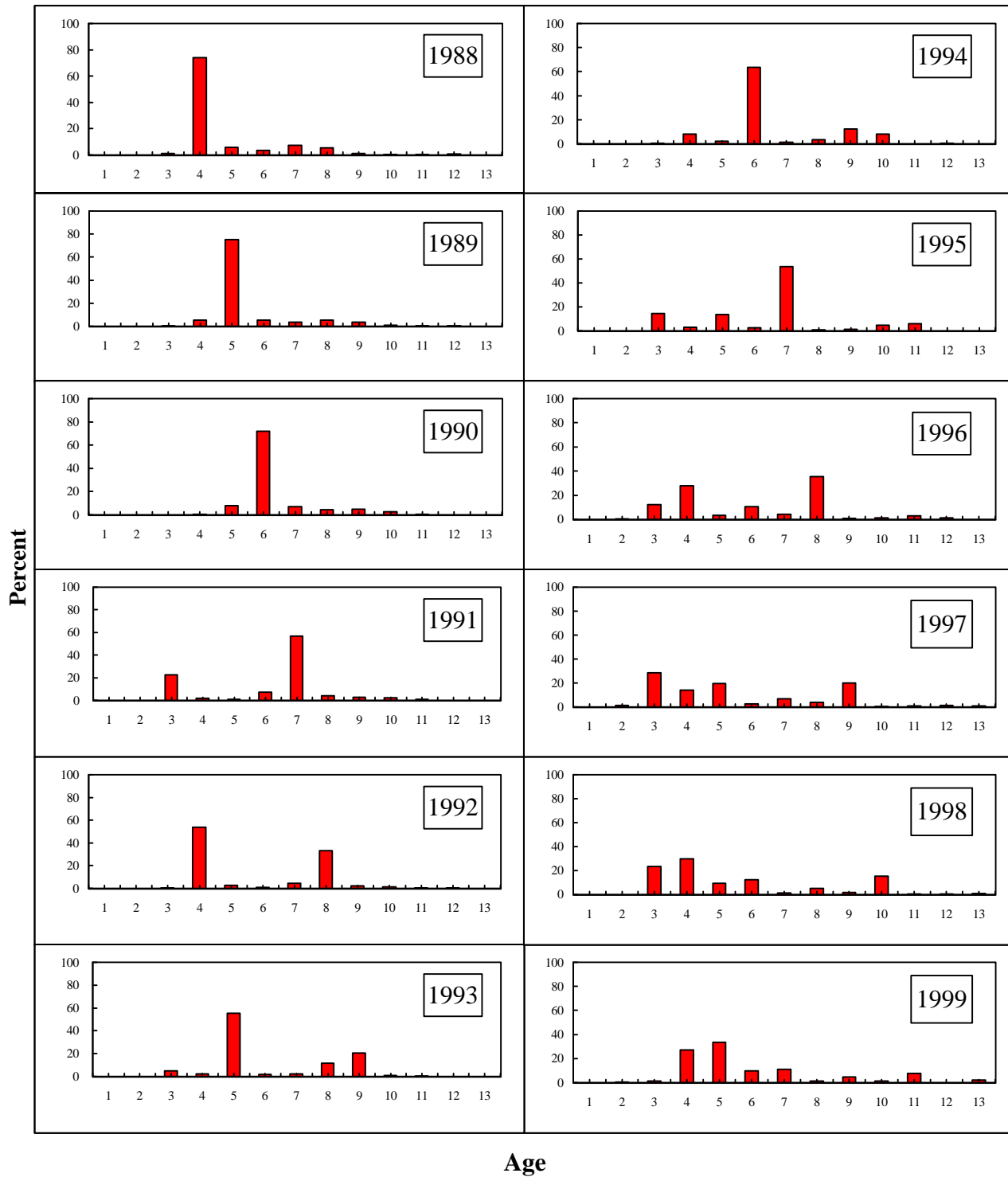
^a The price per pound for spawn on kelp in pounds is based on the final product weight, not harvest weight.

Exvessel Value of Herring Fisheries Prince William Sound



Appendix H.14. Average annual exvessel value of commercial herring fisheries, Prince William Sound, calendar years 1978-1999.

Prince William Sound Herring Spring Run Biomass Age Composition



Appendix H.15. Percent contribution by weight of each age to spring run biomass, Prince William Sound, 1988-1999.

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